SOUTHWEST REGIONAL OFFICE
DIVISION OF ANTHROPOLOGY

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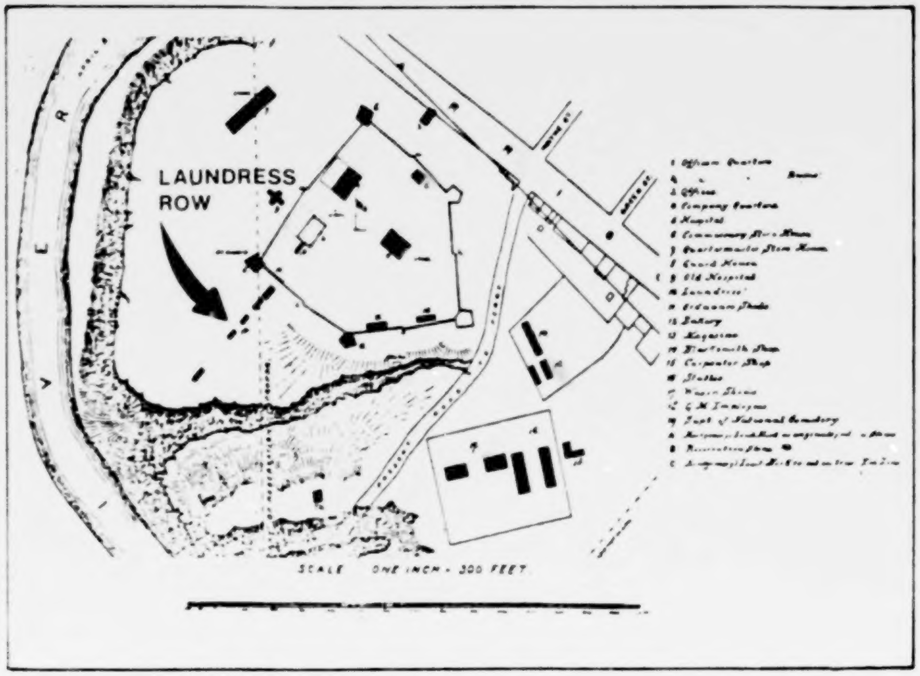
ARCHEOLOGICAL INVESTIGATION FOR CONSTRUCTION OF A PEDESTRIAN TRAIL AND IDENTIFICATION OF LAUNDRESS ROW

FORT SMITH NATIONAL HISTORIC SITE, ARKANSAS



Roger E. Coleman
With a Contribution by
Susan L. Scott and Edwin Jackson

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1990

Branch of Cultural Resources Management
Division of Anthropology
National Park Service
Santa Fe, New Mexico

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MANAGEMENT SUMMARY

To comply with federal accessibility standards prescribed by The National Park Service Management Policies (III-7) and NPS 6 (Chapter 4), a paved pedestrian trail will be constructed at Fort Smith National Historic Site, Arkansas (NPS 1981:59-62). The proposed trail, approximately 1,070 feet long, will connect the parking lot to the park visitor center and to the first fort site on Belle Point (Gaines 1986:48-50).

Archeological clearance for trail construction is required by federal legislation that mandates the protection and preservation of cultural resources including the act of September 13, 1961, that established Fort Smith National Historic Site (P.L. 87-215 75 stat. 489); The National Environmental Policy Act of 1969 (P.L. 91-190; 83 stat. 852); Section 106 of the National Historic Preservation Act of 1966, as amended (P.L. 89-665 80 stat. 915); Executive Order 11593 (36 CFR 800 and 36 CFR 8921); the Archeological and Historic Preservation Act of 1974 (P.L. 93-291 88 stat. 174); the Historic Sites Act of 1935, as amended (P.L. 74-292 49 stat. 666); the National Park Service Organic Act of 1916, as amended (P.L. 95-625 stat. 3467); and the Antiquities Act of 1906 (P.L. 59-209 34 stat. 225). The fieldwork undertaken here complies with cultural resource legislation by: 1) locating archeological remains endangered by proposed construction; 2) assessing the degree of impact; 3) determining the significance of affected cultural resources relative to criteria of the National Register of Historic Places, and if significant; 4) by mitigating adverse impacts.

Archeological investigations for the proposed pedestrian trail occurred sporadically over a four year period. Cumulatively, from October 21, 1985-October 28, 1988, seven months were devoted to the field investigation. A five-phase excavation procedure that ranged from systematic sampling to controlled excavation of significant remains was used to sample, identify, and assess cultural resources, and to evaluate construction impacts. Fieldwork resulted in the excavation of 145 test units, accounting for a total excavated area of 3,728 square feet (346.3 square meters). Seventy three archeological features were identified and 43,906 artifacts were collected from 206 proveniences.

This investigation has been conducted in accordance with the approved scope-of-work and in conformance with policies of the National Park Service, and guidelines of the State of Arkansas as prescribed in the State Plan for the Conservation of Archeological Resources in Arkansas (Davis 1982).

ACKNOWLEDGEMENT

Archeological investigation for construction of the pedestrian trail required the energy and talents of many individuals. The project spanned the tenure of four park superintendents and acting superintendents: JoAnn Kyral, Diane Jung, Reed Detring, and Jim Tuck--all capable site managers who contributed with interest to this undertaking. Jody Parrish and Tracy Oates, National Park Service archeological technicians, participated in project mitigation and the processing and analysis of 43,906 artifacts. Since both of these employees comprised the entire paid field and lab crew, their contribution is especially noteworthy. Wendell Smith, backhoe operator, removed fill overlying the buried historic ground level during phase II and phase IV investigations. His patience and skill made it possible to protect sensitive resources. Susan Scott and H. Edwin Jackson, contracted to conduct the faunal analysis, cheerfully incorporated all comments and suggestions and provided the National Park Service with an excellent product. Likewise, computer specialist Mark Alexander incorporated glass and ceramic data sets into DBASE reports in an efficient and timely manner. Bill Eighmey provided welcome expertise in project photography and production of artifact photographs.

This investigation, conducted with limited funding, was completed only with the assistance of dedicated volunteers. Twenty five volunteers, including civic minded members of the Junior League of Fort Smith, off-duty NPS employees, girl scouts, and other generous community members, donated 496 volunteer hours to this project at no expense to the government. The National Park Service gratefully acknowledges the assistance of Marilyn Kelsey, Cathy Adams, Helen Harper, Susan Reece, Harriette Beasley, Debbie Carney, Wilma McCauley, Virginia Mahoney Jennifer Locovare, Debbie Mack, Alicia Weatherton, Kerry Meekins, Sylvia Coleman, Bill Peerson, Col. Ben Cheaney, Shaun Townsend, Joe McAdams, Steve Klein, Deborah Soap, Amanda Taylor, Catie Fenn, Chris Helms, Dorothy Speak, Laura Garbacik, and Carolyn Kyle.

Without the efforts of dedicated NPS professionals who made it possible for me to resume report writing following my recent move to St. Louis, the project would have languished. In the National Park Service, the goals of one unit can transcend administrative boundaries. Individuals from park-to-regional office, and from region-to-region were instrumental to this undertaking. I want to thank John Cook, Ron Ice, Melody Webb, and Jim Tuck of the Southwest Region, and Don Castleberry, Bill Schenk, Cal Calabrese, Mark Lynott, Jerry Schober, Gary Easton, and JoAnn Kyral of the Midwest Region. Jerry and his efficient staff at Jefferson National Expansion Memorial provided an office, computer time, supplies, and clerical support for the project, making my tour-of-duty there both rewarding and successful. Mark Lynott of the Midwest Archeological Center graciously provided essential supplies and graphic reproduction for report preparation. Many thanks!

TABLE OF CONTENTS

Chapter 1. Introduction 1
  Project History 3
Project Goals 7

Chapter 2. Environmental and Cultural Background 10

  Physical Environment 10
    Location and Topographic Setting 10
    Climate 11
    Vegetation 11
    Geology and Pedology 12
  Cultural Background 13
    Prehistoric Occupation 13
    Historic Occupation 15
Previous Archeological Investigations 20

Chapter 3. Methods and Procedures 28
  Archeological Testing and Excavation 28
    Phase I 28
    Phase II 28
    Phase III 29
    Phase IV 29
    Phase V 30
  Spatial Controls 30
  Laboratory Procedures 31
  Artifact Identification 31
  Artifact Classification 33

Chapter 4. Results of Investigation 35
  Visitor Center Lawn 35
    Introduction 35
    Stratigraphy and Depositional History 37
    Artifacts 39
    Archeological Features 39
    Conclusion 39
  Median Strip 40
    Introduction 40
    Stratigraphy and Depositional History 42
    Artifacts 45
    Archeological Features 46
    Conclusion 47
  Belle Point 47
Introduction 47
    Stratigraphy and Depositional History 48

Table of Contents, continued:

Artifacts ... 48

Archeological Features ... 49
Conclusion ... 50

Chapter 5. Artifacts from the Historic Ground Level on the Median Strip ... 51

Kitchen Group Artifacts ... 51
Food Remains Group Artifacts ... 102
Architecture Group Artifacts ... 103
Furniture Group Artifacts ... 119
Arms Group Artifacts ... 127
Clothing Group Artifacts ... 147
Personal Group Artifacts ... 181
Tobacco Pipe Group Artifacts ... 190
Activities Group Artifacts ... 193
Miscellaneous and Unidentified Artifacts ... 229
Prehistoric Artifacts ... 230

Chapter 6. Discussion ... 239

Chapter 7. Conclusion and Recommendations ... 264

Conclusion ... 264
Recommendations ... 269
Belle Point ... 269
Median Strip ... 269
Visitor Center Lawn ... 270

Bibliography ... 273

Appendix 1. Feature Descriptions ... 287

Appendix 2. Analysis of Faunal Remains by Susan L. Scott and H. Edwin Jackson ... 326

Appendix 3. List of Microfiche Tables ... 354

LIST OF TABLES

1. Representative Profile of Muskogee Silt Loam 13
2. Prehistoric Cultural Chronology of the Ozarks 14
3. Selected Events in the Construction History of Fort Smith 21
4. Archeological Investigations at Fort Smith National Historic Site 26
5. Utilitarian Stonewares by Glaze 64
6. Ceramic Tablewares by Glaze and Decoration 75
7. Glass Tablewares by Decoration 85
8. Glass Tablewares by Form and Glaze 86
9. Glass Bottles by Color 91
10. Glass Bottles by Part and Form 92
11. Glass Bottle Formation 94
12. Window Pane by Thickness and Color 112
13. Nails by Type and Pennyweight 118
14. Metallic Cartridges 137
15. Uniform Buttons 167
16. Summary of Iron Stock Forms 217
17. Summary of Iron Production Forms 218
18. Total Prehistoric Artifacts 232
19. Selected Diagnostic Artifacts 247
20. Ceramic Types and Manufacture Range 251
21. Mean Ceramic Date Computation 253

22. Economic Ranking of Fort Smith Ceramics 259

23. Economic Indices of Fort Smith Historic Ground Level and Nine Arkansas and East Oklahoma Sites 260

24. Diagnostic Prehistoric Artifacts 262

25. Archeological Features 289

LIST OF FIGURES

1. Location of the Proposed Pedestrian Trail 2

2. Design for the Proposed Pedestrian Trail 5

3. April, 1870, Map Depicting Fort Smith 9

4. The Location of Archeological Test Units on the Visitor Center Lawn 36

5. Northeast Profile of Test 14 37

6. The Location of Archeological Test Units on Belle Point and the Median Strip Areas 41

7. Location of the Excavation Grid on the Median Strip 43

8. East Profile of Test 38, Section 8A 44

9. Miscellaneous Kitchen Group Artifacts 53

10. Cutlery 59

11. Manufacturer's Marks 67

12. Ceramic Designs 71

13. Ceramics with Molded Designs 81

14. Glass Tablewares and Canning Jar Lid Liner 88

15. Glass Bottles 96

16. Architecture Group Artifacts 106

17. Selected Stove/Range Parts 121

18. Selected Furnishings 123

19. Arms Group Artifacts 131

20. Clothing Group Artifacts 150

21. Military Accouterments 176

22. Personal Objects ... 184

23. Tobacco Pipe Group Artifacts ... 192

24. Selected Activities Group Artifacts ... 196

25. Wagon Hardware and Accessories ... 202

26. Wagon Hardware and Horse Equipment ... 207

27. Iron Production Debris ... 220

28. Tools ... 225

29. Prehistoric Artifacts ... 236

30. Square Cut Nails by Pennyweight ... 244

31. Sheet Glass by Thickness ... 248

32. The Location and Appearance of Archeological Features Encountered on the Median Strip ... 291

33. The Location of Feature 17 and Feature 25 ... 295

34. The Location and Appearance of Feature 19 ... 297

35. The Location and Appearance of Archeological Features Encountered During Testing on Belle Point ... 303

36. The Location and Appearance of Archeological Features Encountered During Excavation on the Median Strip ... 319

37. The Location of the Exhibit Shelter and Feature 77 ... 323

Archeological Investigation For Construction of a Pedestrian Trail And Identification of Laundress Row Fort Smith National Historic Site, Arkansas

ROGER E. COLEMAN

With A Contribution by
Susan L. Scott and H. Edwin Jackson

INTRODUCTION

This report describes the results of archeological investigation for construction of a pedestrian trail at Fort Smith National Historic Site, Arkansas. Fort Smith National Historic Site was established September 13, 1961 (Public Law 87-215, 75 Stat. 489), to preserve and commemorate two military forts and the Federal Courtroom and Jail of the United States District Court of the Western District of Arkansas. The historic period at Fort Smith spans 79 years from 1817-1896, when the site played an important role in implementing Federal Indian policy. The proposed trail, connecting the park visitor center to Belle Point, will cross the locations of both historic military forts (Fig. 1). Since Fort Smith National Historic Site is included on the National Register of Historic Places, it is protected from destruction or impairment. As prescribed by public law, an archeological investigation was conducted to mitigate adverse effects to significant remains from proposed trail construction.

Investigation of the trail corridor resulted in the identification of 67 archeological features and buried historic ground levels in two locations. Sealed deposits such as these are rare at historic sites and even more so at Fort Smith where urbanization has compromised subsurface integrity over most of the site. As contributing historic resources, both buried ground levels and their contents are considered significant. A combination of avoidance and excavation were

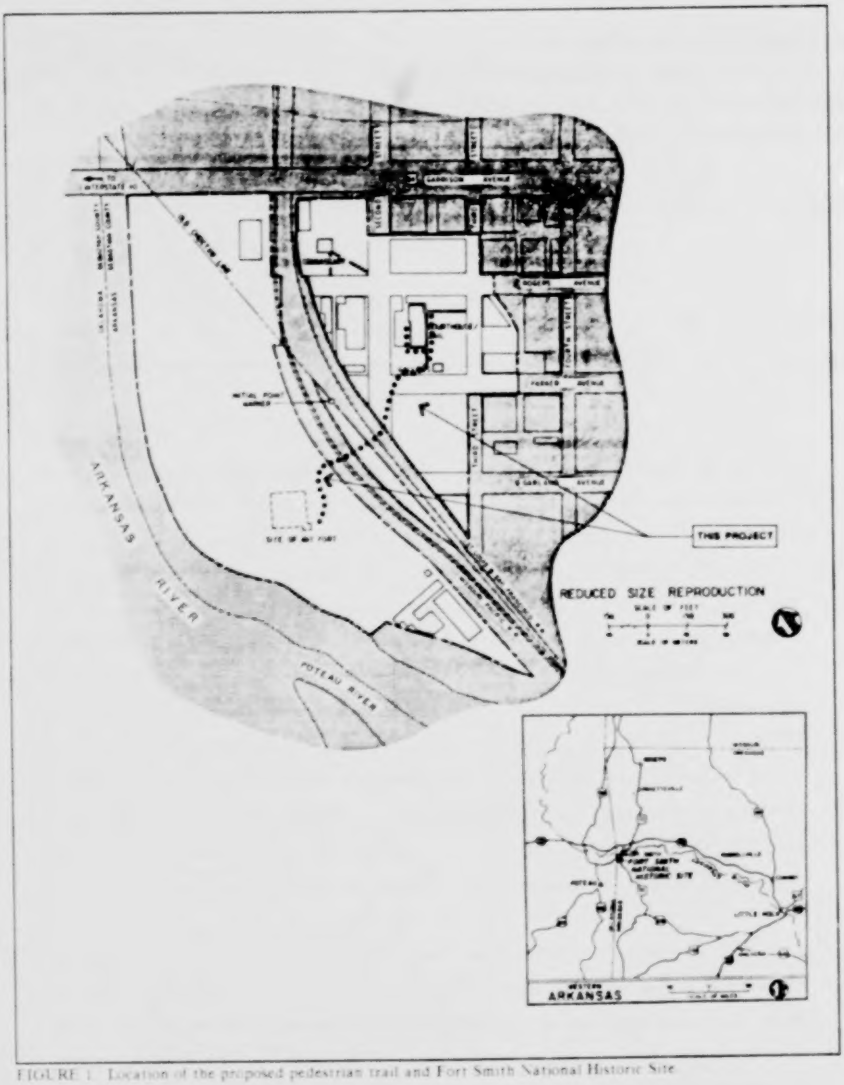

FIGURE 1. Location of the proposed pedestrian trail and Fort Smith National Historic Site.

employed to mitigate construction impacts. Since the historic ground level could not be completely avoided, however, a 2,775-square foot area was excavated, resulting in the acquisition of 43,906 artifacts. This excellent artifact sample from a sealed, uncontaminated deposit provides a remarkable cross-section of historic occupation at Fort Smith National Historic Site. Appropriately, much of the following text is devoted to the description and analysis of these data, both for cultural resource compliance and for research purposes. This artifact sample is an important source for analysis and comparison at Fort Smith and other nineteenth century military sites.

Project History

The Fort Smith National Historic Site General Management Plan directs that a safe "pedestrian crossing...will be constructed from the second fort to the first fort area" (NPS 1981:59). Two railroads cross the site and divide the park into three geographic areas: the second fort site, a narrow elevated median strip between the railroads, and the first fort site on Belle Point. Currently, visitors walking to Belle Point must use a path that employs three sets of stairs and that cross the track beds at grade. To eliminate dangerous train-people conflicts and to comply with Uniform Federal Accessibility Standards, the National Park Service proposed construction of an "overpass" or "foot bridge" to link the two fort sites (NPS 1981:38, 59). The National Park Service approved the project on January 23, 1985, but because of visual impact that would be incurred, the proposed overpass was redesignated as an at-grade crossing (Baker 1987:1).

Preliminary archeological testing was conducted from October 21, 1985-February 13, 1986, on the median strip area. Although a trail alignment had not been formally proposed at this time, it was certain to planners that the walk would cross the 1,000-foot long median strip. Therefore, preliminary testing was undertaken to identify significant cultural resources and if necessary, to develop an appropriate mitigative plan. This investigation revealed an undisturbed, buried historic ground level coterminous with the median strip.

This significant resource contained abundant artifacts and structural remains. Because of the length of the median strip, however, complete avoidance of the area was not feasible. Therefore, recommendations to mitigate construction impacts included avoidance of foundations and features, and 100% excavation of affected historic ground level.

Based on the results of preliminary archeological testing, a suitable trail alignment was proposed in the Landscape Management Plan (Gaines 1986). The Landscape Management Plan (LMP) attempted to minimize impact to cultural resources by completely avoiding known structures and features and by placing the crossing in an area with the lowest artifact density. To further minimize destructive cutting from construction, the LMP specified the use of retaining walls. The document was reviewed by the National Park Service on September 11, 1986, and was approved under a programmatic memorandum of agreement with the Advisory Council on Historic Preservation. Funds for advance planning and pedestrian trail design were programmed for fiscal year-1987. From March 2-May 11, 1987, additional archeological testing of the proposed pedestrian trail alignment on Belle Point was undertaken. This investigation indicated that the [illegible]d surface on Belle Point had been uniformly disturbed to a depth of one [illegible]nd that significant cultural resources were not present. Archeological clearance was recommended provided that an archeologist monitor all cutting during trail construction. Construction funds were programmed for fiscal year-1988 and the construction design was finalized in May.

Final construction plans (NPS 1988) closely follow the original alignment and design specifications provided in the Landscape Management Plan (Fig. 2). Minor changes to avoid disturbing bench marks and desirable trees, however, were made. The project entails construction of a 450-foot long, at-grade, paved trail with a six-foot wide cross-section and a maximum gradient of 4.9%. To achieve this profile, the design specifies a 35-foot wide cut through the median strip and a 23-foot wide, 150-foot long cut on Belle Point. For visitor safety, retaining walls will not exceed three feet in height and slopes above the

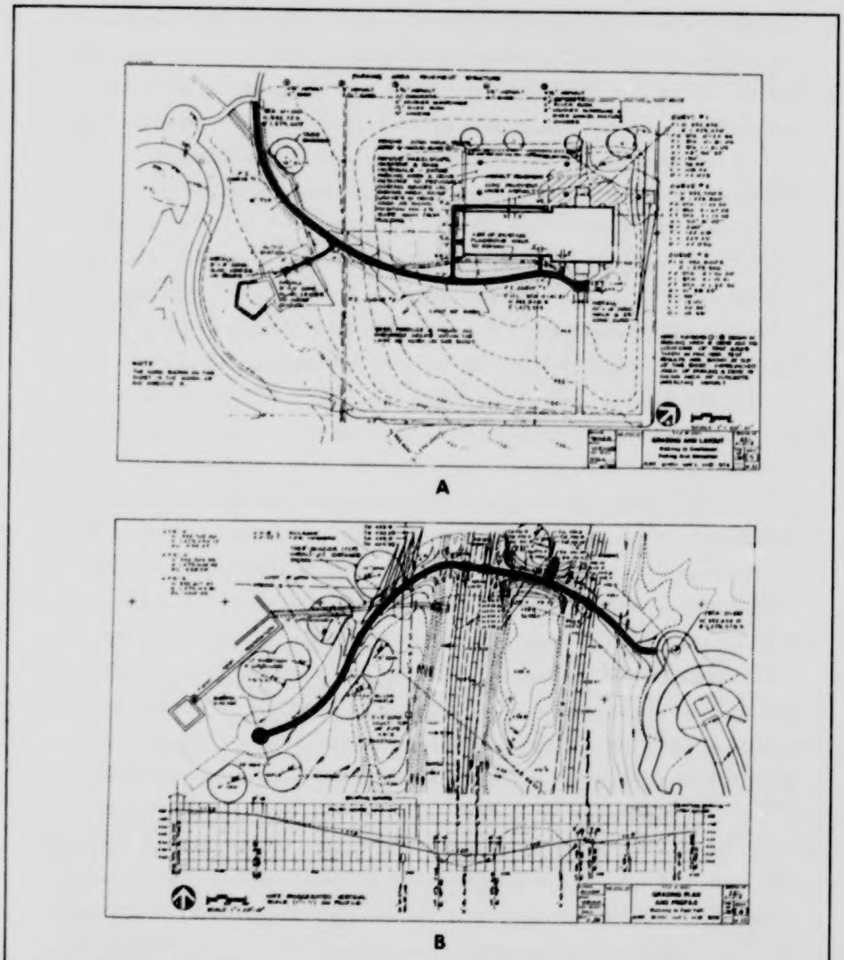

FIGURE 2. Design for the proposed pedestrian trail. A) Section of trail from the parking lot to visitor center. B) Section of trail from parking lot to Belle Point.

retaining walls will be cut at a maximum grade of 3:1. A flight of stone steps will be placed on the median strip to provide safe access to historic monuments located in that area. Railroad crossings on both sides of the median will be marked by four signal masts, automatic gates, and crossing panels. For visitor comfort, a drinking fountain, benches, and an interpretive shelter with covered roof will be constructed at the trail terminus on Belle Point.

The final design analysis (NPS 1988) contains two additives not shown in preliminary drawings. Additive A specifies correction of electrical wiring defects in the new parking lot lighting and additive B entails obliteration of the old parking lot adjacent to the visitor center and construction of a paved trail, per the LMP, from the new parking lot to the visitor center entrance. Additive A will not disturb subsurface remains and required no additional archeological investigation. Additive B, however, created an additional 620 linear feet of trail--all requiring archeological clearance. According to drawing No. 421/41,011A (Fig. 2A), the proposed trail section in additive B requires an at-grade construction with a six-foot wide cross-section for 440 feet of trail from the parking lot to the east visitor center entrance. A second trail section provides essential access for the physically challenged to a wheelchair lift at the west visitor center entrance. This section requires a three-foot wide cross-section for approximately 180 feet of trail. Designs further specify a paved surface with four inches of concrete over two inches of aggregate base. Thus, minimum depth of cutting on the visitor center lawn will be six inches.

Meanwhile, efforts to mitigate construction impacts on the median strip were initiated. A contract to build the pedestrian trail had been awarded to Crawford Construction Company of Van Buren, Arkansas. Work was slated to begin in August, 1988. Therefore, from June 27-July 26, 1988, excavation of significant deposits on the railroad median strip was undertaken. Significant archeological remains were completely removed through data collection and were no longer endangered by proposed construction. It was, therefore, recommended that archeological clearance be provided for construction on the median area with the stipulation that an archeologist monitor all cutting during construction.

Archeological testing for the trail section in Additive B occurred from October 21-October 28, 1988. Several layers of fill were identified in the impacted area. A buried historic ground level occurs 1.4 feet below surface. Although the ground level and its contents are significant historic resources, construction here would not have an adverse effect. Cutting for trail construction in Additive B will extend only six inches below surface. Archeological clearance for this section of trail was recommended providing that all cutting activity would be monitored by an archeologist.

Archeological monitoring during construction of the pedestrian trail was provided on an as-needed basis, whenever cutting occurred. Therefore, monitoring was undertaken sporadically throughout the construction project from November, 1988-April, 1989. Twice during construction, monitoring resulted in the identification of significant cultural resources. Adverse impact to these resources was mitigated through a combination of avoidance and data collection.

Project Goals

The pedestrian trail crosses three park areas: the visitor center lawn, the railroad median strip, and Belle Point. These geographic divisions are also culturally/historically distinct. Trail placement provides an opportunity to sample the exterior of the first Fort Smith and the interior and exterior of the second Fort Smith. Earlier investigations were primarily concerned with tracing the foundations of both fortifications and have neglected to sample domestic and activity areas. Thus, this investigation can reveal additional aspects of the military environment at Fort Smith by addressing these questions:

1) How were areas beyond the garrison wall structured and used by occupants of the first Fort Smith?

2) How were areas beyond the garrison wall structured and used by occupants of the second Fort Smith?

3) What differences exist between the use of space within and beyond the wall of the second Fort Smith?

Although documentation is comparatively rich for nineteenth century military sites, glaring discrepancies do exist. Fort Smith is no exception. Unlike the planned permanent buildings within the garrison walls, small temporary barracks constructed by the troops for their own use are poorly documented. Known historic structures at Fort Smith have been plotted by Coleman and Dollar (1984:Fig. 11), revealing the presence of several buildings near the present-day median strip. A single historic map portrays this row of buildings, listed in 1870 as "laundress quarters" (Fig. 3). Additional historic references to laundress row are noticeably lacking. Archeological investigation can contribute information on this dark corner of Fort Smith history by answering the following questions:

4) What is the location and orientation of laundress row?

5) How were the buildings in laundress row constructed?

6) What is the date of construction and occupation of laundress row?

7) Can the documented function of laundress row be verified?

8) What were the living conditions at laundress row and what influence did the military bureaucracy have on the lifestyle of the inhabitants?

A prehistoric archeological site has been identified at Belle Point, yet is poorly understood. Initial investigation of this location sampled only areas adjacent to the first fort foundation. Although a lengthy multicomponent occupation is evident, little else is known regarding the prehistoric site. This investigation can contribute to knowledge of prehistoric occupation at Fort Smith National Historic Site by addressing these questions:

9) What is the extent of the prehistoric site on Belle Point?

10) What cultural groups occupied the site and what is the length of occupation?

11) What is the function or what functions are represented at the prehistoric Belle Point site?

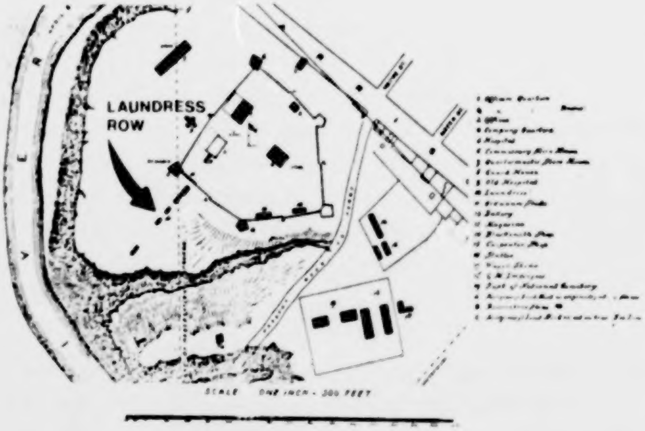

Figure 3. April 1870 map depicting Fort Smith and laundress quarters south of the garrison wall.

CHAPTER 2

ENVIRONMENTAL AND CULTURAL BACKGROUND

Physical Environment

Location and Topographic Setting

Fort Smith National Historic Site is located at the confluence of the Poteau and Arkansas Rivers in the northwestern corner of Sebastian County, Arkansas (Fig. 1). The park is a three-sided, 69.83 acre tract bounded on the west by the Poteau and Arkansas Rivers and on the remaining two sides by the City of Fort Smith. The Union Pacific and Missouri and North Arkansas Railroads cross the park and divide it into three geographic sections: the second fort site, a narrow median strip between the railroads, and the first fort site on Belle Point.

The second fort site is the easternmost division of the park and occurs between elevations 444.4 and 438.0 feet AMSL. The area is a relatively high, but level surface broken only by streets and now partially filled road beds. In places, streets are cut over four feet deep. The Missouri and North Arkansas Railroad, on the west edge of the second fort site, cuts below grade some 10 feet and separates this area from the railroad median strip.

The median strip is an elongated section of land created by divergence of the Union Pacific and Missouri and North Arkansas Railroads. The railroad median is aligned on a north/south axis, is over 1,000 feet long, and only 60 feet wide at the widest point. The total area of the median strip is .79 acres. Cutting for construction of the at-grade railroad tracks has pedestaled the median strip. At the greatest depth, cuts are 10 feet and 13 feet deep on the east and west sides of the median, respectively. Thus, the area displays much topographic variation. Maximum and minimum elevations are 441.5 feet AMSL and 426.3 feet AMSL.

The highest point on the median occurs roughly in the center at the site of the former Quartermaster Building. From this location, the median strip slopes gradually to the north and south.

West of the Union Pacific Railroad lies Belle Point, a prominent bluff that overlooks the Poteau and Arkansas Rivers. At 442.3 feet AMSL, Belle Point juts some 59 feet above the river bank. A partially filled borrow-pit between the riverbank and bluff edge creates an artificially steep slope. Elsewhere, the ground surface recedes gradually. To the north and south of Belle Point at 420 feet AMSL are remnants of a river terrace (T1), small areas within the park boundary.

Climate

According to the Koppen-Geiger system of climate classification, Arkansas is characterized by a warm temperate climate (Cfa) where precipitation is sufficient in all months and the mean temperature for the warmest month is over 71.6 degrees farenheit (Strahler and Strahler 1978:148). Meteorological data summarized over a 29-year period (USDA 1975:3) indicate that in Fort Smith, the highest average monthly temperature occurs in July (93.6 degrees F.). Winters in Fort Smith are relatively mild. The coldest month, with an average monthly temperature of 49.7 degrees F., is January. Average yearly precipitation is greatest in May (4.74 inches) while January receives the least (2.38 inches).

Vegetation

Fort Smith occurs in the Oak-Hickory Region of the Eastern Deciduous Forest (Braun 1950). The typical climax community of the Arkansas Valley is the 'Post Oak-Blackjack Oak-Winged Elm-Black Hickory Forest' (Foti 1974:25). On the most favorable sites, black oak and black hickory predominate. In rugged areas or when frequently burned, shortleaf pine is prevalent. With recurrent burning, forest is replaced by prairie. In Sebastian County, prairies are commonly small and widely dispersed. Dominant prairie grass species include big bluestem, Indian grass, switchgrass, and little bluestem.

Today, ground cover within the park is primarily mown lawn composed of several grass species. These include Bermuda, Johnson, rye, crab, wild oat, wild wheat, nut, and sandbur grasses (Gaines 1986:19). Fifty-one tree species are known to exist within the park boundary, a number of which are post-historic introductions (Gaines 1986:22). Trees and shrubs are found as border plantings along former streets in the second fort area and as open woodland at Belle Point. A narrow strip of forested land that has reverted to a quasi-natural condition borders the Arkansas River.

Geology and Pedology

Fort Smith is located on a soil member of the Leadvale-Taft Association: Muskogee Silt Loam (USDA 1975:5). Soils of the Muskogee series are formed in stratified loamy and clayey sediments on old stream terraces bordering the Arkansas River. Muskogee Silt Loam reflects a relatively well-developed solum with distinctive A and B horizons. A representative soil profile is described in detail in Table 1. Below these upper level soils, a relatively unaltered parent material or C horizon is found. At Fort Smith National Historic Site, the C horizon is composed of fine sands that vary from 11-19 feet in thickness (ALI nd:1). Sands are encountered at about 435 feet AMSL where they exhibit a yellowish-red coloration caused by water percolation through the overlying B3 horizon. With increasing depth, sands assume a tan or blond color. Below the sand lies bedrock of Pennsylvanian age.

Lithology of the Arkansas River Valley consists of intervening layers of shale and sandstone. First the McAlester Formation, a layer of shale and weathered shale that varies from three-to-five feet thick, is encountered. Underlying the shale is the Hartshorne Formation, a hard, grey, micaceous

TABLE 1

Representative Profile of Muskogee Silt Loam

Level	Depth	Color	Texture	Structure
Ap	0-4"	Dark Brown	Silt Loam	Granular
A2	4-9"	Brown	Silt Loam	Fine Blocky
B1	9-17"	Yellowish Brown	Silt Loam	Medium Blocky
B21t	17-27"	Yellowish Brown	Silty Clay Loam	Medium Blocky
B22t	27-40"	Light Brownish Grey	Silty Clay	Medium Blocky
B23t	40-55"	Yellowish Red	Silty Clay	Medium Blocky
B3	55-72"	Reddish Yellow	Silty Clay	Medium Blocky

sandstone that outcrops (at Belle Point) between 410 and 404 feet AMSL. Underlying these is the Atoka Formation, a red colored sandstone that outcrops north of the Arkansas River and Fort Smith National Historic Site (ALI nd:1; Haley and Hendricks 1972:A24-A25).

Cultural Background

Fort Smith National Historic Site is historically and archeologically complex. The park contains a multicomponent prehistoric site and two historic military forts. The second fort also served as a jail and courtroom for the United States District Court for the Western District of Arkansas. Federal use of the site spans some 79 years, a length of time that, for conceptual purposes, is commonly divided into three major periods (eg. Kyral 1980:4): First Fort (1817-1824), Second Fort (1838-1871), and Judicial (1872-1896).

Prehistoric Occupation

The Arkansas River Valley is the least known archeological region in the State of Arkansas (Davis 1982:MA1). Comparatively, little research has been undertaken here. Five archeological surveys and testing projects conducted in the vicinity of Fort Smith have documented 59 prehistoric sites--most without cultural diagnostics (Taylor 1987:6). East of Fort Smith, Hoffman et al. (1977) define a Woodland period Gober complex and a Late Mississippian McClure complex for the Ozark Reservoir. Beyond these exceptions, local prehistory must rely on extrapolations from adjacent areas. The prehistory of northwest Arkansas is summarized by Raab et al. (1982) and Sabo et al. (1982). Cultural development in eastern Oklahoma is described by Bell et al. (1984). For this study, the cultural chronology has been extracted from these sources and presented in Table 2.

TABLE 2

Prehistoric Cultural Chronology of the Ozarks

Cultural Period	Phase	Date Range
Paleo Indian	Paleo Indian	12000-10500 BP
Transitional	Dalton	10500-9500 BP
Archaic	Early Archaic	9500-8000 BP
	Middle Archaic	8000-5000 BP
	Late Archaic	5000-2500 BP
Woodland	Early Woodland	2500-1800 BP
	Middle Woodland	1800-1350 BP
	Late Woodland	1350-1100 BP
Mississippian	Caddo	1100-450 BP
	Neosho	450-300 BP

During archeological investigations at the site of the first Fort Smith (1958-1963), evidence of a substantial prehistoric occupation was brought to light. Beyond a brief description of recovered remains and a now dated interpretation (Dollar 1966), prehistoric occupation at Fort Smith National Historic Site has not been investigated. Furthermore, this site is not formally recorded or listed in the files of the Arkansas Archeological Survey. A reanalysis of the Belle Point assemblage is beyond the scope of this report, but collections generated from this site do reflect an extensive multicomponent occupation--at least within the circumscribed area of the first fort. Diagnostic artifacts indicating Early-to-Late Archaic and Woodland-to-Mississippian occupations are present in the park collection.

Historic Occupation

Following the purchase of Louisiana in 1803, federal officials promoted the removal of southeastern Indians to a "permanent Indian frontier" in the new western possession. In 1809, Osage Indians forfeited their traditional hunting territory for resettlement of their eastern neighbors. In a few years, thousands of displaced Cherokees occupied land on the White and Arkansas Rivers. The new Cherokee-Osage boundary became a source of friction, however, and resulted in frequent clashes between both nations. To deter further hostilities, the United States Government established Fort Smith on the disputed boundary.

The site of the new fort was Belle Point, a prominent bluff overlooking the Poteau and Arkansas Rivers. On December 24, 1817, Major William Bradford and 64 men of the Rifles Regiment, Company A, landed at Belle Point. In eight days, temporary shelters had been hastily erected and work initiated on a permanent fortification. Construction progressed slowly and the fort was not entirely enclosed until after 1820. Upon completion, the fort was a simple log stockade with four sides of 132 feet each and two blockhouses at opposite angles. Barracks, storehouses, shops, a magazine, and a hospital were located within the walls. In February, 1822, Colonel Matthew Arbuckle and five companies of Seventh United States Infantry garrisoned the post. Quarters for the additional troops were erected outside the original fort. Increased hostilities between the Osages and Cherokees prompted the additional troop strength. The location of the post on the eastern border of the newly redefined Indian Territory, however, was too far removed from the arena of hostilities. Consequently, the military departed from Fort Smith in 1824, and established Fort Gibson some 60 miles up the Arkansas River (Bearss and Gibson 1979:8-42).

Fort Smith was not forgotten. By the treaty of 1825, the Choctaw Indians agreed to settle on lands set aside in Indian Territory and Fort Smith was designated the agency for the western Choctaw. In February, 1827, Choctaw agent William McClellan found the post buildings in ruinous condition. Four years passed, however, before the government could repair the structures. On April 26, 1831, Lieutenant Gabriel Rains and a detail of Seventh United States Infantry arrived at the post. Over the next few months, Rains labored to repair the public buildings. By August, Choctaw Indians began trickling into the area (Haskett 1966:213-228).

Just east of Fort Smith and adjacent to the Choctaw boundary line, a sizeable civilian community had emerged on lands owned by John Rogers. Six taverns dominated the community, the closest only a "few paces" from the Choctaw line. Interprising merchants plied the emigrating Choctaws with cheap whiskey. Many of the displaced tribesmen settled nearby and became a source of sustained exploitation. Lieutenant Rains positioned his men on the line to keep peddlers and Choctaws separated. The situation worsened so that in March, 1833, Captain John Stuart and a company of the Seventh Infantry garrisoned the post. Stuart's efforts to control the contraband trade, known as the "Arkansas whiskey war," met with little success. The merchants operated under Stuart's very nose. Whiskey smugglers could slip across the Indian Territory line almost at will. As a result, Stuart abandoned Fort Smith in June, 1834, and established Fort Coffee at a more suitable location in Indian Territory (Haskett 1966:213-218; Bearss 1968:143-172).

As additional tribes were relocated in Indian Territory, fearful residents of the new State of Arkansas requested that a permanent military garrison be placed on their western border. Fort Smithites launched a successful campaign to regarrison Fort Smith. In 1838, congress authorized construction of a new fort and purchased from John Rogers, a 296-acre reservation adjacent to the old fort on Belle Point.

In the spring of 1839, construction of the new fort began. The design called for a pentagonal shaped fort of stone with a bastion at each angle and enclosing seven acres. Inside the wall, several buildings were to be situated around a parade ground including two enlisted men's barracks, two officer's quarters, the commandant's quarter, a hospital, quartermaster store, and other buildings. This ambitious plan, however, would never be fully realized.

Because of events of the next six years, the army completed Fort Smith along much different lines. It had become apparent to the military that armed warriors would not descend on Arkansas from Indian Territory. Yet, hostilities threatened another frontier and war with Mexico loomed on the horizon. Fort Smith was ideally situated to equip military units marching to the Rio Grande and to supply frontier posts in Indian territory. Therefore, in 1845, the half-finished post was formally designated as a supply depot. Without a need for defensive capabilities, portions of the fort curtain wall were never raised to the intended height of 12 feet. To accomodate the vastly increased supply load, foundations of the incomplete commandant's quarter and one of the enlisted men's barracks (Barracks B) were dismantled and used to convert two bastions into commissary and quartermaster storehouses. A third bastion was transformed into a magazine. Upon completion, only two officer's quarters and one enlisted men's barracks fronted the parade ground. Several other structures including maintenance buildings, stables, laundress quarters, hospital, storehouse, and bakehouse were located beyond the fort walls.

Fort Smith was formally garrisoned in May, 1846, and functioned as a supply depot throughout its 25-year long occupation by the military. In the pre-Civil war years, national interests focused on westward expansion. New posts were established in Indian Territory, including Fort Towson and Fort Washita, and supplied by the depot at Fort Smith. On April 23, 1861, Arkansas State Troops occupied Fort Smith. Until September 1, 1863, when Federal soldiers regarrisoned the post, Fort Smith served the Confederate Army of the Trans-Mississippi West as a major supply base and defensive bastion protecting

Southern interests in Arkansas and Indian Territory. During the post-war years, the army again focused efforts on renewed westward expansion. The line of frontier posts had moved so far to the west, however, that supply lines from Fort Smith were stretched to capacity. The days of Fort Smith as a supply depot were numbered.

Other problems plagued the post and eventually caused its abandonment. Housing for the troops had always been in short supply and on November 24, 1865, officer's quarter A burned to the ground. Five years later on December 20, 1870, officer's quarter B suffered the same fate. To the military, the role of Fort Smith as a supply depot was no longer tenable. On July 19, 1871, the Sixth Infantry marched out of the post, the last unit to garrison Fort Smith. Once again, however, the winds of fortune shifted and prolonged the life of the fort.

In 1872, the United States District Court of the Western District of Arkansas occupied Fort Smith. A valuation of property indicated that 27 buildings stood on the former military reserve. Nearly all of these were relegated to civilian or federal use. The former enlisted men's barracks became the federal courtroom and also housed attendant offices. A permanent gallows was constructed along the inward side of bastion 3 or the old magazine and the courtroom basement served as a jail. When overcrowding in this makeshift prison, known as "hell-on-the-border," received adverse public attention, a modern prison wing was added to the south end of the courtroom. This structure was completed in February, 1888.

The Federal Court presided over a vast district encompassing western Arkansas and the entire Indian Territory of present-day Oklahoma. Here, tribal courts had no jurisdiction over white settlers. This legal technicality attracted the most desperate breed of outlaw, who finding refuge beyond the pale of justice, could murder and steal with little fear of retribution. To bring offenders to justice, a federal marshal and a number of deputies, never more than 200 strong, combed this wilderness. When fugitives were apprehended, they were taken to Fort Smith for trial.

Fort Smith is best known for Federal Judge Isaac C. Parker whom President Ulysses S. Grant appointed to the bench in 1875. During Parker's 21 years in office, over 13,000 cases came to trial and 79 offenders were hanged for their crimes. Parker proved to be a tireless defender of Indian rights and through his efforts brought law and order to Indian Territory. As the non-Indian population increased, new courts emerged in Indian Territory, gradually reducing Parker's authority. On March 1, 1895, Congress enacted legislation that limited Parker's jurisdiction to several counties in western Arkansas. This legislation became effective on September 1, 1896.

Beginning during the Federal Court occupation and escalating in the late nineteenth and early twentieth centuries, a series of events occurred that changed the appearance of the historic fort (Table 3). By the act of February 17, 1883, Congress granted right-of-way through the former military reservation to the St. Louis and San Francisco Railroad. Sometime between May, 1886, and February, 1889, the railroad company removed a portion of the garrison wall to accomodate trackage, effectively separating the Quartermaster Building from the rest of the fort. The Missouri Pacific Railroad soon paralleled the St. Louis and San Francisco and also cut through the reservation.

A May 29, 1896, bill called for lands inside the garrison to be granted to the City of Fort Smith. Although use of the Federal Jail continued as late as 1914, the government transferred the remainder of the military reserve to the city. On February 26, 1897, Congress enacted legislation to extend Parker and Rogers Avenues, and Third and Second Streets through this property. The Old Fort Reserve Addition was surveyed in June and sold to private concerns. The stone wall of the fort was dismantled between July 1, 1897, and July 1, 1898, after which, streets were extended. By 1900, several large multi-storied brick buildings had been built or were under construction and the Old Fort Reserve Addition emerged as the light industrial/warehouse district of Fort Smith. The courtroom/jail complex became a civic center and housed a variety of city offices and community organizations. Sometime around the turn of the century, Belle Point was densely populated and acquired the name of "Coke Hill."

Public interest in the old fort increased during the early twentieth century. In 1910, the Old Fort Museum Association occupied the Commissary and used the building as a museum. In 1957, Public Historical Restorations Incorporated restored the courthouse to its original condition. Local businessmen donated funds to purchase private interests on Coke Hill and in 1959, sponsored the first archeological excavation at the site. In 1961, the City of Fort Smith donated 11 acres of land containing the site of the first fort, the courtroom/jail complex, and the Commissary Building to the National Park Service. Since creation of the Fort Smith National Historic Site, land holdings have been increased to 69.83 acres and several intrusive streets and post-historic buildings have been removed (Paige 1981:46-66).

Previous Archeological Investigations

Exploratory excavations at Fort Smith National Historic Site were initiated in 1958 and 1959 at the site of the first Fort Smith (Moore 1963). In 1963, these operations were expanded into a full-scale archeological excavation to document surviving structural remains (Dollar 1966). Exploration in the vicinity of the second Fort Smith, however, has been sporadic and less intensive than at Belle Point. To date, a total of 12 small-scale test excavations and monitoring projects have been conducted (Table 4). Unfortunately for the present study, prior research provides little background for the location of the proposed pedestrian trail. The visitor center lawn and the railroad median strip are virtually unexplored and investigations on Belle Point have been confined to the first fort foundations and interior fort areas.

TABLE 3

Selected Events in the Construction History of Fort Smith

1817	In December, Fort Smith was established on Belle Point.
1819	By orders of commanding officer Major William Bradford, married men were permitted to build cabins for their families beyond the garrison walls.
1822	In February, Colonel Matthew Arbuckle assumed command of the post, bringing five companies of the Seventh Infantry to compliment the garrison. To accomodate this greatly increased troop strength, new quarters were erected. Since the fort was not altered, it is presumed that these additional barracks were situated beyond the fort walls.
1824	Fort Smith was abandoned. John Rogers, caretaker of the post, is reported to have used one blockhouse as a cotton gin and to have erected two houses on the site.
1831	On April 26, Fort Smith was regarrisoned by Lieutenant Gabriel Rains and a detachment of the Seventh Infantry. Since the public buildings would house the Choctaw annuity, some structures were repaired. To provide construction material, other buildings poorly suited as storehouses, were razed.
1833	On March 29, Captain John Stuart and one company of Seventh Infantry were stationed at Fort Smith to control contraband whiskey trade. One tavern is reported to have been located 150 yards east of the post just across the Choctaw boundary.

Table 3 (Continued)

1838	Congress authorized construction of a new fort near Belle Point.
1839	Work began on the fort in late February. A collection of log buildings had been located along the projected principal front of the fort. Project director Major Charles Thomas had these relocated nearby to house the workers. Thomas' quarters, at the site of gate 1, remained in place until the fort was completely outlined.
1840	A map of the second fort by Major Charles Thomas depicts a mess house and blacksmith shop south of wall section 3 and bastion 2. The blacksmith shop was located in the vicinity of the present-day median strip.
1844	On June 27, Colonel George Croghan inspected the new works at Fort Smith and reported that the quarters of the commanding officer, alone, were in good condition. All others were "rapidly approaching dilapidation." All of the buildings stood on wooden posts two-to-three feet high and were constructed after the Canadian manner with short logs set into grooved uprights. Rotting posts caused the dwellings to settle and separate.
1846	The second Fort Smith was formally garrisoned in May. Using stone recycled from unfinished Soldier's Barracks B, the Quartermaster Building was completed atop the foundation of Bastion 2 by September 30.
1849	The single soldier's barracks burned, creating a housing shortage. By April 9, a shed under which tents could be pitched was being constructed. By May 16, the Secretary of War directed that, using soldiers as laborers, temporary barracks be erected. Commanding Officer Matthew Arbuckle considered constructing quarters with brick chimneys near the fort wall.

Table 3 (Continued)

1857 Montgomery argued with Jessup regarding the lack of quarters at the post. The only quarters that Montgomery listed were those provided for two companies in the brick soldier's barracks. Montgomery complained That there was no housing for the company laundresses. Jessup refused to permit the construction of additional quarters.

1859 A War Department directive specified that no new buildings should be erected at posts except such as can be built by troops.

1867 The Nineteenth Infantry garrisoned Fort Smith, creating an urgent need for additional housing. It is reported that a portion of the fort wall was dismantled to erect two sets of company quarters.

1869 Three inspections were made at Fort Smith around 1869. The reports are conflicting, but this may be the result of different times the inspections were made. Unfortunately, the exact date of only one inspection is known with certainty. General R.B. Marcy reported that Fort Smith had quarters for only 200 men--one brick and one frame building. Colonel A.B. Ayers reported that a section of the garrison wall had been taken down by industrious troops to erect two sets of company quarters, possibly as early as 1867. An adjoining map depicts a single L-shaped building occupied by Co. G, south of wall section 3 in the vicinity of the present-day median strip. Assistant Surgeon J. Morris Brown reported that a number of small frame buildings were located outside the walls and occupied as quarters by married soldiers.

1870 A map of Fort Smith prepared by an army survey team shows "laundress row," a line of five structures south of the Quartermaster Building and wall section 3. At least one of these quarters was situated on the present-day median strip.

Table 3 (Continued)

1871	The military abandoned Fort Smith. A valuation of property indicated that 29 buildings stood on the government property at this time.
1872	The United States District Court of the Western District of Arkansas moved into the second Fort Smith. Nearly all of the old military buildings had been relegated to civilian or federal use.
1883	The congressional act of February 17, granted right-of-way through the former military reservation to the Saint Louis & San Francisco Railroad Company.
1886	A Sanborn insurance map reveals that by May, trackage did not yet cross the former military property. Tracks ended at Garrison Avenue north of the fort.
1887	Newspaper accounts indicate that the Missouri Pacific Railroad Company had acquired right-of-way along Gurdon Branch south of Fort Smith. Presumably, this indicates that right-of-way through the former military reserve had already been obtained.
1889	A Sanborn insurance map reveals that by February, the St. Louis & San Francisco line breeched the fort walls and separated the Quartermaster Building from the remainder of the fort. The Missouri Pacific Railroad paralleled the St. Louis & San Francisco, diverging on the west side of the Quartermaster Building to create a median strip between both lines.
1894	A photograph taken before 1894 reveals a one room frame structure on the south end of the median strip.
1896	A May 29 bill called for lands inside the old garrison walls to be granted to the City of Fort Smith.

Table 3 (Continued)

1897 On February 26, legislation was enacted to extend Parker, Rogers, Third, and Second Streets. The Old Fort Reserve Addition was surveyed. Beginning July 1, in just under one year, the second fort wall was dismantled and sold.

1899 The Fort Smith Steam Bottling Works, on the former parade ground, was completed. Several other large multi-storied brick buildings had been built or were under construction.

1901 An October, Sanborn insurance map shows the Old Fort Reserve Addition. Two small structures appear on the median strip south of the Quartermaster Building. By this time, the St. Louis & San Francisco Railroad has three lines. Sometime before 1964, the Missouri Pacific Railroad would also add another track. These additions indicate that the median strip was cut and reduced in size.

1904 On June 28, the West Fort Smith Addition was platted. Streets and lots were set out on Belle Point. The median strip became lot 5 with sections 1-4.

1905 The February 10 act of Congress extended the western boundary of Arkansas to include the West Fort Smith *Addition*.

1908 The Chickasaw/Choctaw tribal council sold all lots in the West Fort Smith Addition to individual purchasers.

1930 About this time, the Kansas City Southern Railroad Company demolished the Quartermaster Building.

TABLE 4

Archeological Investigations at Fort Smith National Historic Site

First Fort

1958-9	Exploratory excavations to locate remains of the first Fort Smith (Dollar 1960).
1963	Excavation to expose the first fort foundation prior to stabilization (Moore 1963; Dollar 1966).

Second Fort

1978	Test excavation to locate remains of bastions and walls. Identified remains of Bastion 4 (Anderson 1979).
1980	Additional test excavations to locate remains of bastions and walls. Identified Wall Section 10 adjacent to Bastion 1. Found no remains of Bastion 3 *or the adjacent Gallows (Anderson 1981).*
1981	Additional test excavations to locate remains of bastions and walls. Identified Wall Sections 2 and 3, and remains of Bastion 2. Identified historic building foundation on southeast corner of visitor center lawn. Reinvestigated sites of Bastions 3 and 4 (Traylor 1981).
1982	Excavation at the Commissary Building. Identified remains of porches. Identified stratification and reinvestigated Wall Section 10 (Dollar 1983).

Table 4 (continued)

1982-3	Monitoring demolition of the Fort Smith Steam Bottling Works by Clyde D. Dollar. Identified remains of Officer's Quarters and the location of the garrison Flagpole (Coleman 1984b).
1983	Excavation of the garrison Flagpole. Identified flagpole support structure and recorded architectural details (Coleman 1983).
1984	Monitoring during insertion of utility lines at the Commissary Building. Examined soil stratification, located Wall Section 1, exposed Wall Sections 1 and 10 prior to stabilization (Coleman 1984a).
1985	Archeological testing for parking lot construction. Examined soil stratification identified in a historic ravine, and two post-1900 building foundations (Coleman 1986).
1985-6	Archeological testing to delineate second fort wall and bastions. Identified and delineated Bastions 4, 5, and 2. Identified and delineated adjoining Wall Sections 1, 2, 3, 8, and 9. Encountered an historic midden beyond Wall Section 1 (Coleman, report in preparation).
1986	Monitoring during burial of overhead telephone lines. Identified historic midden from the first community of Fort Smith and recorded stratigraphy (Coleman 1987b).
1987-8	Archeological investigation of the second fort Cistern and Cistern overflow drain. Identified and described construction details of the Cistern and associated overflow drain (Coleman 1989).
1989	Archeological testing and monitoring for storm drain construction. Examined fill and recorded stratigraphy in historic ravine south of Belle Point (Parrish 1989).

CHAPTER 3

METHODS AND PROCEDURES

An archeological investigation was undertaken to identify significant cultural resources and to mitigate adverse effects from proposed construction of the pedestrian trail. To systematically sample the area slated for construction, this project employed a five-phase testing and excavation procedure.

Archeological Testing and Excavation

Phase I

Phase I testing provided a preliminary assessment of the contents, depth, and integrity of site deposits. Test units, 2x2 feet square, were placed at even intervals along the projected trail centerline. Soil was removed by arbitrary 10 cm. (3.94 inch) levels or by natural stratigraphy if present. Soil was dry-screened through 1/4 inch hardware cloth and all artifacts were collected for analysis.

Phase II

Because of their suitability for encountering structural remains, linear test trenches were employed during phase II investigations. The trail centerline used in phase I testing became the baseline from which test trenches were extended. Two-foot wide trenches, spaced at even intervals, were projected from the baseline. Trench length depended on the proposed construction boundary as depicted by the 1986 Landscape Management Plan site graphic (Gaines 1986). For spatial control, trenches were divided into sections that, depending on local conditions, varied from 5-10 feet in length. All trench sections were numbered sequentially beginning at the baseline. Thus, should a later change in trail placement require, trenches could be extended.

Test units were excavated as deep as necessary to encounter sterile soil. In disturbed areas, soil was removed by shoveling. Test floors were carefully scraped with hoe and trowel and inspected for the presence of cultural features. Only culturally/temporally diagnostic artifacts were collected from disturbed levels. In undisturbed deposits such as the buried historic ground levels, soil was dry-screened through 1/4 inch hardware cloth and all artifacts were collected for analysis.

Phase III

During phase III testing, test units were extended over cultural features encountered during earlier work. Phase III tests exposed features on two or more boundaries--thus, dimensions vary and tests may be trenches or block units. Features were numbered sequentially and designated by numbered strips of flagging tape on 16d nails. Detailed plan drawings of phase III excavation units and features were constructed and photographs were taken. To establish age and cultural context, artifacts were collected from feature surfaces. Coring was employed to determine feature depth.

Phase IV

Phase IV work entailed the excavation of significant cultural resources endangered by proposed trail construction. Significant cultural features and a portion of the undisturbed historic ground level within the proposed trail corridor were excavated.

Significant features in the proposed construction area were excavated by trowel. First, features were cross-sectioned and removed in halves. For vertical control, fill was excavated in 10 cm. (3.94 inch) levels. Feature contents were dry-screened through 1/4 inch hardware cloth and all artifacts were collected. Appropriate records were generated at each stage of feature excavation including plan and profile drawings, photographs, and fieldnotes.

Since the at-grade trail would impact the buried historic ground level, a 100% excavation of the affected area was conducted. First, overburden was removed by front-end-loader. A grid-system composed of 63 5-foot squares or 1,575 square feet was located on the historic ground level. The grid was designed to impact as little of the historic ground level as possible. Since this significant deposit averaged only .4-foot (12 cm.) thick, units were excavated in one level. Soil was removed by shovel scraping and dry-screened through 1/4 inch hardware cloth. All artifacts were collected.

Phase V

Archeological monitoring was conducted during all cutting for construction of the pedestrian trail to assure that remains of historical importance were not destroyed. Whenever a change of soil or a cultural disturbance was encountered, operations were halted and an assessment of significance conducted. Likewise, whenever building stone, brick, and historic artifacts appeared in the excavation, a determination of context followed and work was altered or continued accordingly.

Spatial Controls

For mapping purposes, National Park Service boundary markers were used as datum points. These concrete and brass markers are located with respect to the universal transverse mercator grid and provide easily accessible horizontal/vertical controls. Excavation units were established with transit and recorded on a standard park base map scaled to 20 feet per inch.

Laboratory Procedures

Artifacts were washed, sorted, and identified. Processing was designed to accomodate the National Park Service Museum Handbook, Part II (1984) that requires artifacts to be stored by type and provenience and that encourages only one set of catalogue numbers per collection. Artifacts were first sorted by material (eg. glass, ceramic, metal, and bone) and placed within plastic bags with provenience tags. In this way, objects were never separated from their respective provenience data and placing field sack numbers on artifacts was avoided. Artifacts were sorted again, by type (eg. ceramic tableware, window pane, metallic cartridges, buttons, etc.) and rebagged by provenience. These basic units, defined by type and provenience, are ready for accessioning per the museum handbook (NPS 1988). For archeological purposes, the artifacts are easily tabulated and described at this level of sorting--although determining minimum numbers of objects and cross-mending ceramic and glass containers is difficult.

Artifact Identification

A variety of sources were consulted to identify and date artifacts. Most prominent among these were Diess (1981), Wilson (1981), and McKearin and McKearin (1948) for glass; Price (1982), Noel-Hume (1980), Wetherbee (1980), Kovel and Kovel (1953, 1986), Gaston (1983), Cunningham (1982), and Majewski and O'Brien (1984) for ceramics; Lord (1982), Steffen (1980), Herskovitz (1978), Brinkerhoff (1972), Chappell (1972), and Todd (1980) for military accouterments; Johnson (1948) and Albert (1976) for uniform buttons; Barnes (1985) and Lewis (1968) for ammunition; Van der Sleen (1965) for beads; and Spivey (1979) for wagon hardware and blacksmith supplies. Excellent sources of identification for hardware and domestic furnishings include reprints of the Sears and Roebuck catalogue (1902), The Montgomery Ward catalogue (1895), and the 1865, Russell and Erwin hardware catalogue (APT 1980).

For comparative purposes, an effort was made to standardize artifact descriptions. White's (1978) descriptive nomenclature for glass bottles was consulted as was Jones' (1971) format for describing bottle kickups and empontiling marks. Ceramic methodology is basically that proposed by South (1977) and widely modified for application to nineteenth century ceramic assemblages (eg. Spivey et al. 1977; Smith et al. 1981; Barr 1984). Creamwares were recognized by the presence of yellow tinted glazes. Care was exercised during the analysis of the Fort Smith collection to prevent intentionally yellow-glazed tablewares from being grouped among creamwares. Occasionally, such glazes occur on mocha decorated vessels but they usually exhibit a clear glaze on interior surfaces. Three sherds with this glaze combination occur in the collection--without a clear glaze on one surface, it would have been difficult to separate them from true creamwares. Pearlware determination is based on Price's (1982:13-14) criteria for distinguishing between pearlwares and whitewares. Only when a sherd exhibits an overall bluish-green cast on body surfaces, is it considered pearlware. Early clear glazed whitewares may exhibit blue puddling in crevices but lack the greenish tint produced by the lead glaze. Other distinguishing characteristics were used to separate pearlwares from whitewares. Since the lead based glaze is softer than the clear alkaline glaze, pearlwares exhibit more surface crazing and exfoliation. Furthermore, because only dark blue transfer prints can withstand the high firing temperatures required for lead glazes, other colored transfer prints should not occur on pearlwares (Lofstrom et al. 1982:8; Majewski and O'Brien 1984:34).

Stoneware, as employed herein, is defined on the basis of form and glaze after the approach used by Stewart-Abernathy (1986:56). These attributes are more reliable indications of function than porosity, the typical characteristic used to distinguish stonewares from earthenwares. Because of differential firing, some stoneware vessels can be quite soft and porous. In fact, Smith et al. (1981:144) observe that a single stoneware vessel can exhibit wide variation in hardness.

Tablewares from Fort Smith reflect three pastes: porcelain, ironstone, and earthenware. Porcelain has a translucent, highly vitrified paste that is easily distinguished from earthenware. These soft paste ceramics are opaque and have a porosity greater than 50% (Gaston 1983:13). Earthenware and ironstone, however, are less easily separated. In 1813, Charles Mason patented ironstone, an earthenware hardened by the inclusion of petunse (Wetherbee 1980:14). Some archeologists distinguish between earthenwares and ironstones, observing that the latter exhibit a harder paste and greyish white surface (Lofstrom et al. 1982:8; Majewski and O'Brien 1984:22). Actually, a continuum of hardness and color is evident and as South (1974:248) points out, the two wares are difficult to distinguish. For the purposes of this analysis, earthenwares and ironstones are not separated.

Artifact Classification

Artifacts are organized after South's (1977:92-94) "type-ware-group-classification" that combines functionally similar artifacts at the group level. This emic categorization is behaviorally relevant and facilitates intersite comparison and analyses. South recognizes nine artifact groups including: kitchen, bone, tobacco, architecture, furniture, arms, clothing, personal, and activities artifact groups. Many researchers employing South's classification--originally designed for eighteenth century sites--have adapted it for use with nineteenth century remains (eg. Westbury 1977:63, 66; Bento 1988:48; Crouch 1978). Most changes have focused on the addition or manipulation of artifacts at the class level.

Using a sample of artifacts from the phase II investigation of the pedestrian trail project at Fort Smith, Bento (1988:43-48) altered South's classification to emphasize activities at a nineteenth century military site and to facilitate comparison of military and civilian sites. In South's original classification, military items are placed in the activities group. For compatibility with civilian sites, Bento incorporates uniform buttons and military accouterments as classes within the clothing group. Toys are placed in the personal group and are not intermingled with activities. Writing equipment is combined with furnishings and this new artifact class is believed to mirror office activity. Most differences, however, are found at the activities group level where Bento recognized six artifact classes sensitive to military activities: construction, shipping container, transportation, blacksmith, agriculture, and medical/veterinary. Construction and agriculture classes remain intact per South's original use. The transportation class is essentially the same as his "stable and barn class" but the new designation reflects an emphasis on the transshipment of supplies. Shipping class is similar to South's storage item class with two exceptions: lead bale seals, removed from the clothing group, are included here with barrel hoops. Since it represents consumption and not shipping, the bibb cock is placed in the kitchen artifact group.

As employed here, the classification scheme departs from Bento's original use on three points. To distinguish between office and barracks functions, writing class artifacts are separated from furnishings and included in the activity group. Because of the difficulty in separating the two, ranges and heating stoves are combined and included in the furniture artifact group. A basic divergence from both South and Bento occurs at the bone group. South incorporates carbonized plant remains into the activities group. Since such remains at Fort Smith are apparently food related, they are included as an artifact class with eggshell, mussel shell, and bone in the bone group. The bone group is retitled "food remains group."

CHAPTER 4

RESULTS OF INVESTIGATION

The proposed pedestrian trail crosses three geographic divisions within the park: the visitor center lawn, median strip, and Belle Point areas. The use history of these areas varies markedly and as a result, each reflects major differences in age of deposits, artifact density, stratification, and subsurface integrity. The differences between them demands that each site area be considered separately.

Visitor Center Lawn

Introduction

Archeological investigation of the proposed pedestrian trail, from the parking lot to the visitor center, was conducted from October 21-October 28, 1988. Six field days were devoted to the project. A 620-foot long section of trail was investigated on the visitor center lawn. In phase 1 testing, thirty hand-excavated shovel tests (tests 1-30) were placed 10 feet apart on the proposed trail centerline (Fig. 4). Since the former parking lot on the west side of the visitor center had not been demolished, 100 feet of proposed trail in this area could not be shovel tested. Furthermore, 200 feet of proposed trail occurred within the former Parker Avenue right-of-way and required no testing. Prior archeological investigations demonstrated that this area is cut below historic grade and that cultural resources are not present (Anderson 1979, 1981; Traylor 1981). It was recommended, therefore, that archeological monitoring be conducted in these areas instead of testing. Overall, investigation sampled 78 square feet or 7.2 square meters of site area and resulted in the recognition of a buried historic ground level and historic structural remains on the visitor center lawn.

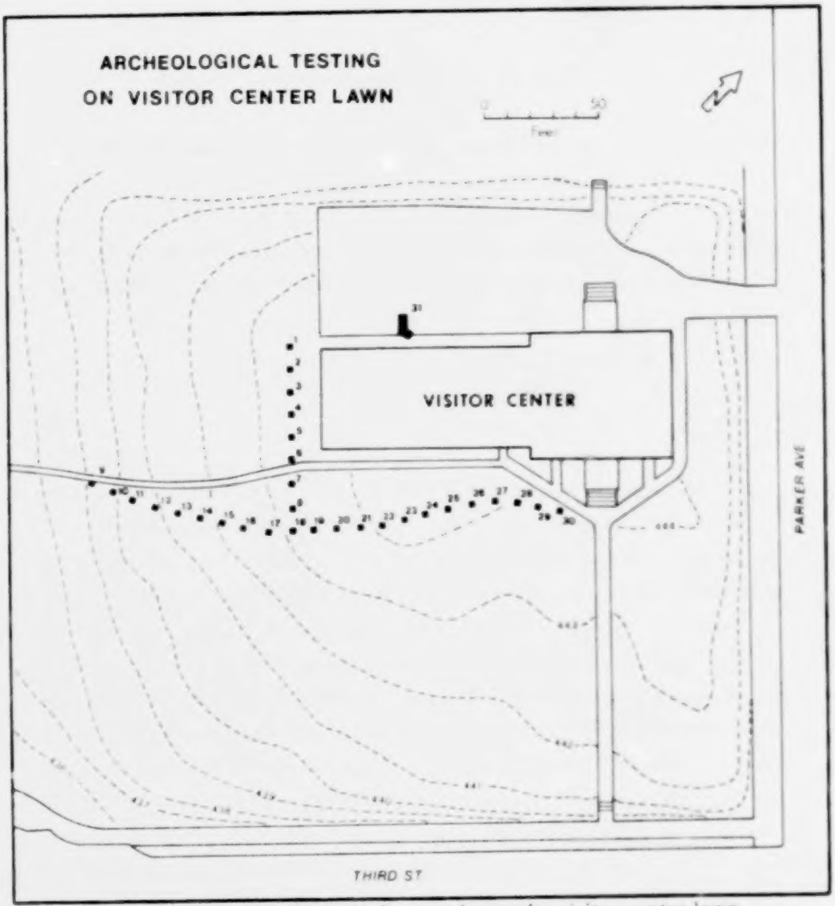

Figure 4. The location of archeological test units on the visitor center lawn.

Stratigraphy and Depositional History

The stratigraphic history of the visitor center lawn is relatively complex. Archeological investigation reveals the presence of six distinctive soil zones, all fill episodes (Fig. 5). Utilizing these data, the following historical summary may be extrapolated.

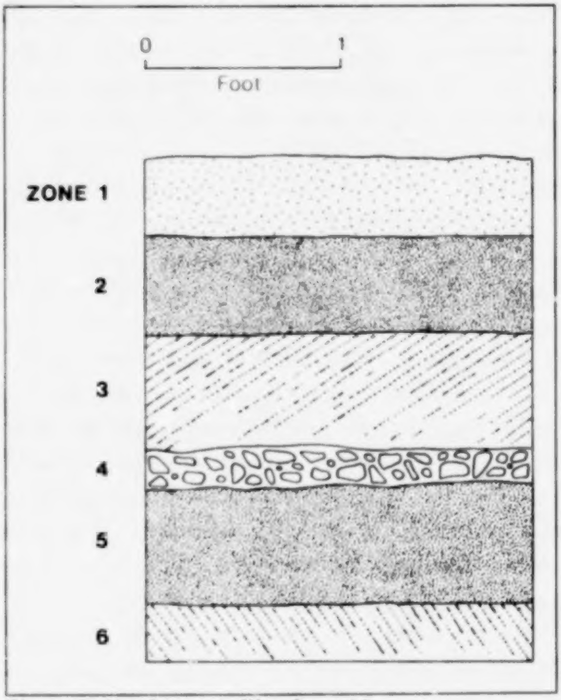

Figure 5. Northeast profile of test 14.

On the visitor center lawn, the lowest identified zone in the sequence is a fill episode of undetermined depth that corresponds to historic fill found in many other areas of the site. This is a yellowish brown silt deposited to achieve a level grade during the earliest phase of second fort construction (eg. Coleman

1987b:17, 24). Directly overlying this fill is an historic ground level (zone 5) ranging from .2-.6 foot thick and varying from brown-to-dark brown in color. Since the historic ground level directly overlies the remains of Barracks B, the foundation of an historic military structure in test 31, it is attributed to the post-1846 period. In turn, the historic ground level is covered by a dense rubble lens containing second fort period construction debris (zone 4) identical to that found in the basement excavation of Barracks B. Zone 4 varies from .1-.8 foot thick across the site and is deepest near the 1888 Jail addition. That structure bisected the Barracks B basement, partially destroying the older building. Thus, the rubble is interpreted as "throw-out" from the construction of the 1888 Jail. Notably, one broken terra-cotta roof tile, used only in construction of the Jail, was observed on the surface of zone 4. Therefore, the underlying historic ground level can be securely dated from 1846-1888.

The surface of zone 4 may have served as a post-1888 ground level, but not for long. The rubble lens is covered by another fill episode ranging from 1.0-1.4 foot thick. This soil (zone 3) is a yellowish brown silt with occasional red clay mottles. Zone 3 is similar to fill on the median strip and other deposits found on the site that date to the post-1897 period when the second fort walls were demolished for development of the Old Fort Reserve Addition. In all probability, this distinctive soil originated from nearby street cutting and basement excavations. The upper .8-1.0 foot of this fill (zone 2) is a dark brown layer containing clear machine made bottle fragments, a portion of a hobbleskirt-pattern cola bottle patented in 1915, plastic coated electrical wire, and safety glass containing wire mesh. The content and depth of zone 2 indicates a recent and highly disturbed ground level. Overlying portions of zone 2 is a discontinuous, brown, sandy fill that covers the south half of the visitor center lawn. This soil, a favored fill of the National Park Service, was probably deposited in conjunction with removal and filling of Parker Avenue on the south side of the visitor center lawn. The sandy fill becomes progressively deep in that direction.

Artifacts

A number of artifacts were recovered during archeological testing. Although these have not been tabulated, some basic observations can be made. Compared to an historic ground level identified on the median strip beyond the garrison wall, zone 5 on the visitor center lawn has a sparse concentration of artifacts. The most common items from this historic ground level are slate shingle fragments, probably from roofing episodes, and cinders, probably from coal burning stoves in the nearby Soldier's Barracks. A lack of residential debris is notable.

Archeological Features

Only the former parking lot area contained archeological features. Because specified compaction could not be achieved in the trail bed at this location, the project contractor excavated a backhoe pit to assess subsurface deposits. This carefully monitored excavation, designated test 31 (Fig. 4), revealed historic structural remains. Fill in a basement excavation is encountered 2.0 feet below surface in test 31. The basement floor and one surviving course of sandstone foundation occur 4.7 feet below surface. These remains (feature 78) are described in further detail in Appendix 1 and are believed to represent Soldier's Barracks B, an unfinished building of the second Fort Smith. The foundation of Barracks B was constructed prior to September 6, 1840, but was razed six years later to provide construction stone for the Quartermaster Building (Table 3).

Conclusion

Significant archeological remains are present on the visitor center lawn. These include the basement and fill in Soldier's Barracks B (feature 78), an historic ground level (zone 5), and perhaps unidentified deposits underlying this. Impact to feature 78 was mitigated through data retrieval and avoidance during subsequent construction. Since the minimum depth of cutting for trail construction was six inches, the 1.4-foot deep historic ground level was not endangered. Construction of this section of the visitor center trail, therefore, has not adversely impacted significant resources.

Median Strip

Introduction

Archeological testing on the median strip was conducted over a four month period from October 21, 1985-February 13, 1986. Two east/west baselines were established on the median strip, one on each side of the extant trail so that trenches could be extended north and south of the baselines without disrupting pedestrian traffic (Fig. 6). To adequately investigate the median strip, three two-foot wide trenches spaced 15 feet apart, were projected from each base line. Thus, phase II testing employed six trenches that, together, total 530 linear feet (T35-40). For spatial control, trenches were divided into 10-foot long sections and, beginning at the baselines, were numbered sequentially. As a result, trenches could be extended to accomodate shifts in pedestrian trail placement. This initial testing resulted in the recognition of eighteen archeological features. During phase III testing, seven additional trenches were opened (T41-47) to delineate these remains. Phase II-III testing sampled a 1,338 square foot (124.3 square meter) area on the median strip.

Early in the test excavation, it had become apparent that soil below the sod level was not a natural in-situ horizon and that a former ground surface would be found below this fill. To guage the contents and depth of this hypothesized buried ground level, four 2x2-foot square units (T35S1A, T35S6A, T38S4A, and T38S8A) were opened in the existing trenches. With the presence of the buried ground level confirmed, a backhoe was used to remove intervening fill.

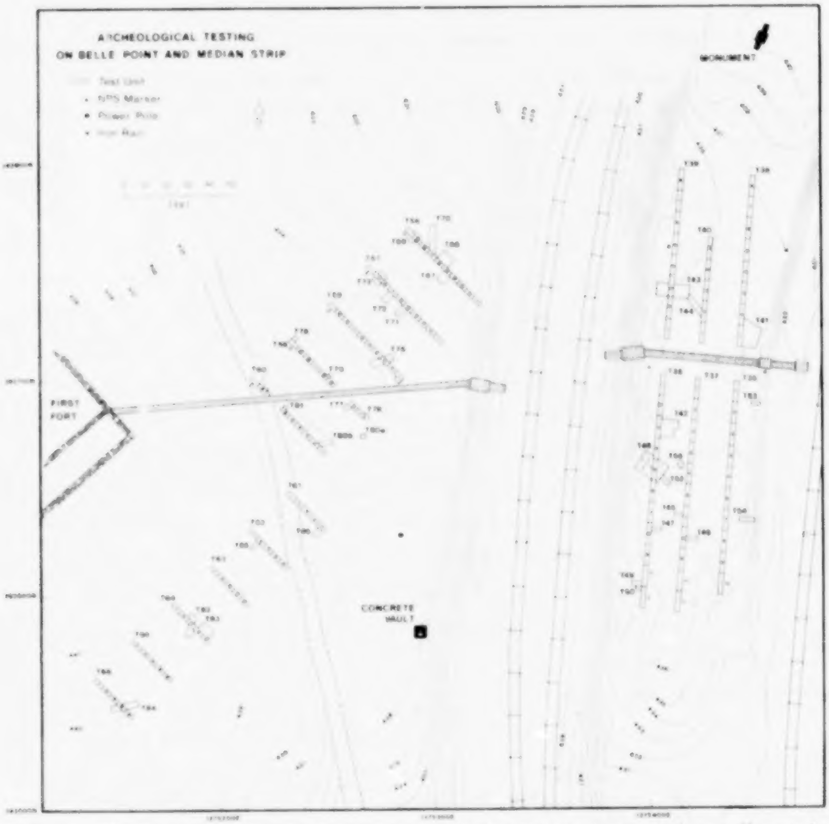

Figure 6. The location of archeological test units on Belle Point and the median strip areas.

To investigate the buried historic ground level, the standard testing procedure was repeated. Testing employed existing phase II trenches. The historic ground level was only .4 foot thick and in the absence of natural stratification, was excavated as one level. Soil was dry screened and all artifacts were collected. Eight additional subsurface features were encountered. Six trenches (T48-52, 55) were excavated during phase III testing to delineate these features. Two other tests (T53-54) were placed to provide cross-sections of the historic ground level at the railroad cut. Archeological testing sampled 1200 square feet (111.5 square meters) of the buried historic ground level.

Based on the results of archeological testing, the proposed pedestrian trail was located to avoid significant features on the median strip. Yet, the buried historic ground level, a significant park resource, could not be completely avoided. Therefore, from June 27-July 26, 1988, a 100% excavation of the affected deposit was undertaken. Twenty one field days were devoted to the project. A grid system was designed to cover the area without impacting more of the historic ground level than necessary (Fig. 7). To expose the buried historic ground level, 2.0-3.5 feet of overburden was removed by backhoe. Grid points were established at historic grade and 63 squares containing 1,575 square feet (146.3 square meters) were excavated by hand. Soil from the historic ground level was dry screened and all artifacts were collected. Five additional archeological features were encountered during mitigation, increasing the total of identified features on the median strip to 31.

Stratigraphy and Depositional History

Archeological deposits on the median strip are consistent. A buried historic ground level averaging .4 foot thick is coextensive with the entire median area (Fig. 8). It is an easily recognized, very dark brown (10yr2/2) silt that contains an abundance of historic artifacts (zone 3). Approximately 16 artifacts are recovered for every square foot area excavated. Overlying the buried ground level is an equally extensive fill deposit, .6-3.5 feet thick. Thirteen distinct zones are found within this fill that probably reflect discreet dumping episodes. The major component of this fill, however, is a dark yellowish brown (10yr4/6) silt with common, medium-coarse, red (2.5yr4/6) clay mottles (zone 2). This distinctive fill has been found over much of the second fort site. The historic

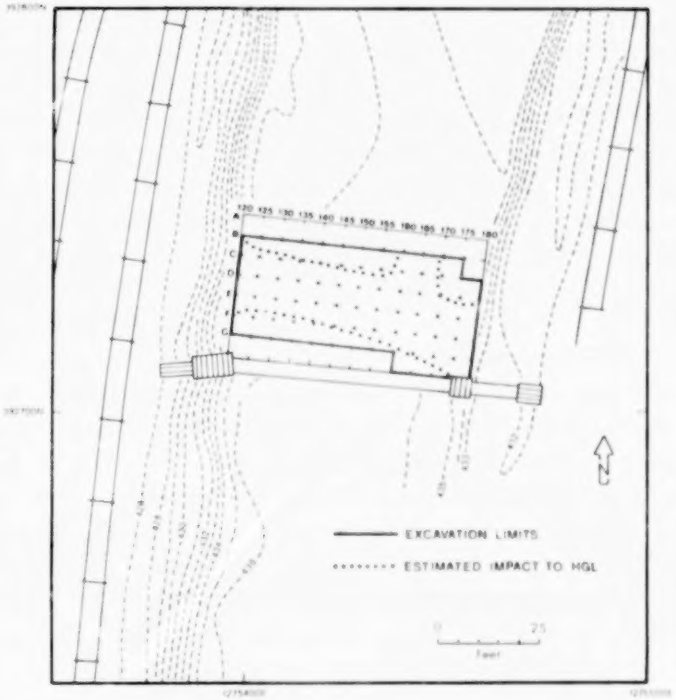

Figure 7. Location of the excavation grid on the median strip.

ground level rests atop natural horizons of Muskogee Silt Loam. The profile of test 38, section 8A, reveals a brownish yellow (10yr6/6) silt (zone 4) B1 horizon over a yellow (10yr7/8) clayey silt soil (zone 5) that corresponds to horizon B2 (Fig. 8).

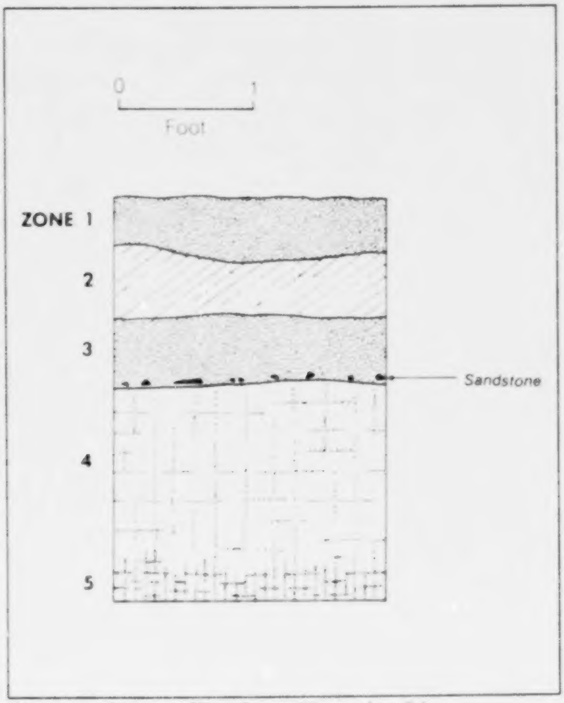

Figure 8. East profile of test 38, section 8A.

Historic documentation and artifacts recovered during the investigation may be used to establish a date for the historic ground level and overlying fill deposits. Several creamware ceramic sherds (ca. 1792-1820), one artillery button (1813-1814), and a rifle regiment button (1816-1821) relate to the first fort occupation and were probably deposited within the historically documented time range of the first Fort Smith (1817-1824). The majority of artifacts recovered, however, clearly indicate an extensive occupation during the second fort period (1846-1871) and a number of other items reveal continued occupation in the decades of the 1870s through 1890s. These include cartridge casings manufactured after 1874 and 1877, improved tooled bottle necks dating from the early 1870s, amethyst tinted glass sherds dating as early as 1880, and a cuff button with a patent date of 1888. A terminus post quem for the historic ground level is provided by five improved tooled, crown soda bottle necks, manufactured after 1892. A suggested terminus ante quem may be set at 1899, the date that the Meek Brothers' Fort Smith Steam Bottling Works began production. Their early soda bottles are excellent time markers and occur frequently at Fort Smith National Historic Site where the factory was once situated. Meek bottles do not occur in the buried historic ground level but are common above the fill (zone 2) in the extant ground surface. Thus, it may be speculated that the median was filled between 1892-1899. By cross-correlating soil types, this time range may be refined even further.

In September, 1986, archeological test units were excavated on the former Meek Bottling Works property to locate wall section 1 of the second Fort Smith. The same characteristic fill found on the median strip (zone 2) and visitor center lawn (zone 3) was also observed overlying the foundation of the second fort wall on the Meek construction site. The fort wall was dismantled before July 1, 1898, and the bottling plant completed before the end of 1899. In all probability, fill on the median was deposited at the same time as that on the Meek lot, in late 1898 or early 1899. A likely source for this fill would have been from street cutting and basement excavation in the developing Old Fort Reserve Addition. This is the only plausible source for the amount of fill involved.

Artifacts

A mix of nineteenth and twentieth century artifacts are associated with the extant ground surface. Therefore, only culturally/temporally diagnostic items were collected from this level. These are noted, as appropriate, in Appendix 1.

Testing and excavation of the buried historic ground level on the median strip generated a plethora of artifacts from the historic period at Fort Smith. The investigation produced 43,906 artifacts from this significant deposit. These are described in detail in Chapter 5. Faunal remains have been analyzed and reported by Susan L. Scott and H. Edwin Jackson. Their report is included here as Appendix 2. Because of the overwhelming numbers involved, artifact provenience and metric data has been extracted from the report text. This information is tabulated and presented in microfiche form. Thus, Tables MF 1-MF 50, as cited in the report text, refer to artifact tables included in the accompanying microfiche. Appendix 3 is a list of all microfiche tables.

Archeological Features

Thirty-one archeological features were defined on the median strip (Appendix 1). Eighteen of these are on the upper ground surface and date to the twentieth century. These include an iron reference stake (F7), four round post molds (F6, 8-9, 18), four erosional cuts containing cultural fill (F10, 14-16), three naturally occurring rodent and tree root disturbances (F11-13), and a ca. 1898/9-1930 trash midden concentrated in a natural depression (F17). Thirteen features are associated with the buried historic ground level on the median strip and predate 1898/9. Eight of these, encountered during archeological testing, include a stone dressing station or driveway associated with the Quartermaster Building (F25), a single round post mold (F24), two trench features that are presumed to be footing trenches (F22-23), a charcoal concentration with reddened soil that may mark a burned structure (F21); a tree root cavity intentionally filled with cultural debris sometime during the military occupation (F20); and a fireplace foundation that is believed to mark the site of a temporary barracks, ca. 1855/4-1886/9 (F19). The remaining five features, encountered during project mitigation, include two erosional cuts with cultural fill (F72, 74); a plaster concentration situated atop the historic ground level, ca. 1898/9 (F73); a large post hole or pit intruding from the upper ground surface (F75); and a single square post mold and post hole (F76).

Conclusion

Significant archeological remains occur on the railroad median strip. These include all cultural features and artifacts associated with the buried historic ground level. Adverse impact to these resources was mitigated through a combination of avoidance, excavation, and construction monitoring. Preliminary archeological testing revealed eight features associated with the historic ground level. Their presence was considered in the planning process and the trail was positioned to avoid them. The affected area within the proposed trail right-of-way was then excavated and all artifacts were collected. During project mitigation, five additional features were encountered. Feature 74 is a natural erosional cut without cultural associations and required no mitigative action. Likewise, an intrusive pit from the extant ground surface (F75) was not deemed significant. Finally, feature 72, an erosional cut containing blacksmith debris, was not excavated. Because the feature coursed along the north boundary of the excavation grid, it would not be directly impacted by construction. Furthermore, an adequate sample of blacksmith biproducts had been acquired from units overlying feature 72, and additional data retrieval was unnecessary. Feature 72 was, however, accurately described and mapped in plan view. To mitigate impact to other significant features, a plaster concentration (F73), and a square post mold (F76) were completely excavated.

Belle Point

Introduction

Archeological testing for the proposed pedestrian trail on Belle Point was conducted from March 2-May 11, 1987. Overall, 1,112 square feet (103.3 square meters) of site area were sampled on Belle Point. During phase I investigation, seven 2x2-foot square test units were excavated to assess site deposits (T56S1A, T58S1A, T60S1A, T61S1A, T62S1A, T64S1A, and T66S1A). Next, during phase II testing, 11 trenches, totalling 380 linear feet, were excavated (T56-66). Tests were spaced 25 feet apart and extended perpendicularly to the principal axis of the proposed trail (Fig. 6). For spatial control, trenches were divided into five foot sections. Thirty six subsurface archeological features were encountered. These were delimited during phase III testing by opening 21 additional units (T67-79, T80a-80b, T81-86). During this excercise, eight new archeological features were discovered. Finally, one feature was identified during monitoring of trail construction, increasing the total of identified archeological features on Belle Point to 45.

Stratigraphy and Depositional History

Soil deposits on Belle Point are simple. Four soil zones are represented. First, an AP horizon or topsoil, a dark brown silty loam, occurs from 0-.3 foot deep. From .3-.5/1.0 foot deep, a brown silt loam A2 horizon is found. The A2 horizon is abnormally thick and contains abundant artifacts and pulverized brick. Clearly modern objects were found in the lowest level of this artifact bearing deposit. The A2 horizon was probably disturbed in 1962, when Belle Point was landscaped by bulldozing. Photographs of this activity suggest that radical mixing and movement of site deposits occurred. At .5/1.0 foot deep, a sterile yellowish brown silty loam B1 horizon is encountered. At 1.5 foot deep a sterile argillaceous horizon (B21t) occurs.

Artifacts

Among 816 Anglo-American artifacts recovered during phase I testing, most are clearly late nineteenth and twentieth century in age and probably originated from the posthistoric Coke Hill occupation. Hallmarks of this recent occupation include round nails, crown bottle tops, plastic, clear and amethyst tinted glass, asbestos and composition shingles, decal printed ceramics, concrete, hard fired brick, terra-cotta tile, and improved tool and machine finished bottle necks. Only a handful of artifacts may be considered historic. These include 25 square nails, one general service military button, one mutilated lead-elbow smoking pipe, one creamware sherd, nine pearlware sherds, and four burned and clear glazed sherds with historic design motifs. Thus, only five percent of the artifact sample can definitely be assigned to the historic period. It was not considered feasible to screen these disturbed soils and artifacts were selectively collected during subsequent testing on Belle Point. Whenever present, diagnostic artifacts were collected from feature surfaces. These are noted, as appropriate, in Appendix 1.

Archeological Features

Forty-five subsurface archeological features were encountered during testing at Belle Point (Appendix 1). Delimiting features during phase III testing made it possible to identify and assess these resources. To enumerate, 11 features are from natural disturbances such as filled erosional cuts, rodents and tree roots (F35-36, 38, 40, 45, 48, 50, 56, 59, 65, 67); 19 features are round post molds from former fencelines (F29-30, 32-33, 41-44, 46, 51-52, 61, 63-64, 66, 68-71); one feature is a square post mold (F49); five features are privies (F27-28, 34, 37, 60); one feature is an iron reference stake, probably from a former survey (F47); six features are utility line trenches (F31, 39, 53-55, 62); and two other features are anomalous, brick filled depressions (F57-58). The age of the majority of these features has been established from artifacts found on feature surfaces. With the possible exception of three features, all are from the twentieth century Coke Hill occupation of Belle Point. Two brick filled depressions (F57-58) and a square post mold (F49) may date to the period of the second Fort Smith.

Archeological monitoring during construction of the pedestrian trail has resulted in the identification of an historic structure associated with the first Fort Smith. On November 21, 1988, contractors excavated pier footings for the exhibit shelter at the head of the pedestrian trail on Belle Point. Four pier excavations exposed portions of a previously unidentified archeological feature (F77). Preliminary testing in 1986 had failed to discover these remains, located only six feet beyond the westernmost test unit of the project (T66). Feature 77 is probably the cellar for an outbuilding of the first Fort Smith. The feature is encountered 1.4 feet below surface, is greater than 3.1 feet deep, and contains artifact bearing fill (Appendix 1).

Conclusion

Archeological testing did not reveal significant cultural resources in the proposed trail right-of-way on Belle Point. Approximately 95% of all artifacts recovered from the disturbed topsoil are late dating. Likewise, only seven percent of all features encountered during testing are potentially historic. These include one post mold and two brick-filled depressions. The post mold is isolated and the brick depressions have no other artifact associations. These three features will not yield important information about historic occupation and are not considered significant. Likewise, artifact bearing deposits are quite disturbed and reflect little-to-no cultural integrity. Feature 77, encountered during monitoring of trail construction, is a significant historic resource. Four pier excavations for an exhibit shelter exposed the edge of the structure. Damage to the resource was, therefore, minor and impact was mitigated through data collection.

CHAPTER 5

ARTIFACTS FROM THE HISTORIC GROUND LEVEL ON THE MEDIAN STRIP

The 43,906 artifacts recovered from the buried historic ground level on the railroad median strip are described here. For comparative purposes, artifacts are arranged and presented in South's (1977:92-94) group and class format.

KITCHEN GROUP ARTIFACTS

The kitchen artifact group contains 17,371 objects from 19 artifact classes.

Bibb Faucet (1)

One cast iron faucet from Fort Smith (Fig. 9E, Table MF.1) is similar to the "plain bibb" marketed in 1865, by the Russel and Erwin Manufacturing Company (APT 1980:276-279). Plain bibbs came in eight sizes graded by internal bore diameter. Designed to regulate the removal of liquid from wooden casks, the bibb faucet employs a long, tapered, hollow shank that is driven or screwed into a cask. The distal end of the shank curves downward to form a spout from which liquid is collected. Fluid flowing through the faucet is regulated by a lever or toggle handle that opens and closes a simple gate mechanism. The Fort Smith specimen is a 1/2 inch, plain bibb faucet with lever-style handle (broken) that once attached to a movable ball over the gate mechanism. The downward curving spout supports a slight protrusion or bail catch at the point of curvature so that a container could be suspended from the spout. Since the shank is broken, it can not be determined if this specimen is a screw or drive shank bibb. Such faucets were apparently requisitioned by the quartermaster since an 1850 inventory for Fort Towson discloses that twelve "metal faucets" were on hand

(Bento 1988:114).

Gridiron (1)

A fragmented gridiron recovered during the pedestrian trail investigation is a handled, cast iron cooking utensil (Fig 9B, Table MF.1). The gridiron is composed of a circular frame with a projected diameter of 8.5 inches. The frame encloses horizontal grate bars. Grate bars have a triangular cross-section and are spaced .45 inch apart. An integral, 3.3-inch long handle protrudes from the gridiron frame. The .65-inch diameter, round handle is ornately cast with a trifid-shaped head. The handle contains a .5-inch diameter perforation--evidently for suspending the utensil when not in use. Gridirons marketed in an 1865 catalogue (APT 1980:394) have tripodal feet and are evidently intended for open hearth cooking. The fort Smith specimen displays evidence of intense heat.

Coffee Mill Grinder Wheel (1)

One fragment of a cast iron grinding wheel from an upright box coffee mill was recovered (Fig. 9D, Table MF.1). The interior surface of this heavy, cone-shaped wheel is covered with uniformly spaced diagonal ridges. Coffee beans placed in the hopper of a coffee mill fall onto this metal grinding surface. The wheel is rotated by a hand-operated crank and ground coffee falls into a wooden drawer below. Coffee mill parts are common on nineteenth century military sites and have been recovered at Fort Sill (Spivey et al. 1977:35), Fort Bowie (Herskovitz 1978:68), and at Fort Washita (Lewis et al. 1975:245).

Cast Iron Containers

One hundred seventy cast iron fragments are from relatively thin walled cooking vessels (Table MF.2). At least two types can be distinguished: flat based

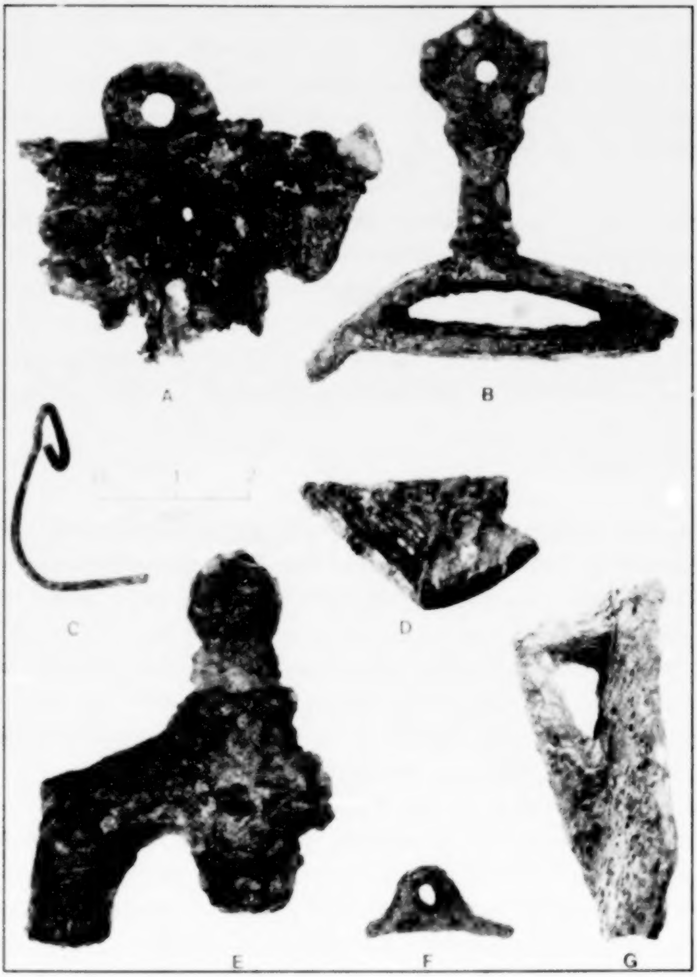

FIGURE 9. Miscellaneous Kitchen Group Artifacts. A) Tin kettle with bail ear; B) Gridiron; C) Can opener key; D) Coffee mill grinder wheel; E) Bibb faucet; F) Lug from Yankee bowl; G) Round pot handle.

containers such as bake ovens and spiders, and globular bodied pots and boilers. "Skillets and lids" and "iron pots" were frequently requisitioned by the quartermaster for Fort Smith and its dependent posts (Bento 1988:110).

Spiders/Bakeovens (23)

Twenty-three fragments of cast iron are from the base or cover of relatively thin walled, flat bottomed cooking vessels. The Russel and Erwin Manufacturing Company advertised a covered bake oven and a variety of spiders, styles that could account for the flat cast iron fragments in the collection (APT 1980:391-393). Since no other distinguishing features are evident, a minimum of one such vessel is represented.

Kettles (147)

The majority of all cast iron fragments are clearly from kettles. Three feet, six handles, two lugs, four rims, and 132 body sherds are from a minimum of five vessels. Two types of kettles are represented. The first is a large, globular bodied vessel with rounded, tetrapodal base and a wide, everted rim. Ten body sherds in the collection indicate that, at least occasionally, this kettle was adorned with raised horizontal bands. Two types of handles occur including an angular 7-shape handle (Fig. 9G), much like a teacup, and a U-shape handle--both types attached to the kettle at the juncture of rim and body. In 1865, the Russel and Erwin Manufacturing Company marketed an identical kettle, inconspicuously called "roundpot" (APT 1980:392). The second type of kettle is a smaller form represented by two cast iron lugs perforated with a .25-inch diameter hole for a wire bail (Fig. 9F). The Russel and Erwin catalogue illustrates similar appearing "scotch" and "Yankee bowls" (APT 1980:392). These relatively small kettles have a footring base, an expanding body, and wide orifice. Two opposing lugs for a wire bail adorn an otherwise simple rim.

Tin Containers (2,238)

The manufacture of tinware in the United States began as early as 1770 (Fontana and Greenleaf 1962:67-70), but a patent for canning in tin containers was not granted until 1825. The first recorded use of the tin can in America was in 1839, when rising glass prices forced commercial canning ventures to rely on the metal container (Busch 1981:96). Tin cans are abundantly represented at both civilian and military sites from the mid-nineteenth century and later. A total of 2,238 tin fragments from Fort Smith represent product containers or kitchen utensils and have been included in kitchen group artifacts (Table MF.3). Tin does not preserve well under local site conditions, however, and only 121 (5%) of the sample can be formally identified.

Product Containers

Seventy-seven tin artifacts are large enough to be identified as product containers. These include 63 fragments of cylindrical tin cans, nine sections of square tins, two portions of cans not identifiable to shape, and two caps from containers of unknown form. The most complete specimen is a cylindrical, flat top can with soldered seams. The caps include both a plain press-on, cylindrical cap and a threaded screw-on, cylindrical cap. A tin pill box in the collection is described with the medicine/veterinary class artifacts in the activities group section.

Kitchenwares

Forty-four tin artifacts represent containers for food preparation. These include 41 rim, body, and base fragments from vessels of undetermined shape; one rim and one rim with lug from a tin kettle (Fig. 9A); and a plug for repairing leaky utensils. The kettle rim with lug is identical to period camp kettles issued by the military (Lord 1982:167) and the Russel and Erwin

Manufacturing Company produced the same "kettle ear," offered for sale in their 1865 catalogue (APT 1980:381). The Fort Smith specimen exhibits a flat, wrought iron lug, shaped like a violin. An upper, smaller circle is perforated with a .275-inch diameter hole to accomodate a wire bail. The lower, larger circle is fastened to the container body by two rivets. The kettle rim has a slightly extruding lip and vertical seam created by folding and soldering. The plug recovered at Fort Smith is essentially an iron rivet with copper bur used to repair a leaky container. Sheet iron or tin from the container wall is visible between the rivet head and bur. The rivet head is highly corroded and shape is indeterminate. The copper bur is .532 inch in diameter and length from rivet head to bur is .75 inch.

Wrought Iron Handles (2)

Two handles of wrought iron were recovered (Table MF.1). Both examples are forged from round iron stock--bent in a shallow U-shape--with flattened ends. Ends were once riveted to a container such as a tin kettle. Several other vessel forms, however, utilized similar handles including pudding pans, soup stock pans, deep dish pans, bread raiser, collanders (Montgomery Ward 1895:430-433), hot water urns, preserve kettles, and milk strainers (Sears and Roebuck 1902:584-590). Both handles display different dimensions, indicating a minimum of two such vessels. The first, of .35-inch diameter stock, exhibits interior dimensions of 2.71 inches wide and 2.25 inches high. The second handle, of .2-inch diameter stock, exhibits interior dimensions of 2.3 inch wide and .9 inch high.

Lead Foil Wraps (17)

Among the Fort Smith artifacts are 17 wads of lead foil (Table MF.4). All appear to average one mil (.01 inch) in thickness and were probably foil wraps covering bottle closures. Lead foil wraps are evident on beverage bottles from the 1860s period steamer Bertrand (Switzer 1974). One whiskey bottle neck in the collection of Fort Smith National Historic Site is an improved tooled finish lip with cork closure and a lead foil wrap that dates to the post-1871 period. Such wraps are still used today on some wines and beers (Crouch 1978:75).

Can Opener Key (1)

One strip-type can opener key was recovered (Fig 9C, Table MF.4). Made of heavy gauge brass wire, the key exhibits an oval-loop bow, .72x.32 inch, and a long shank with a partial length of 2.4 inches. The stripping slot at the bit of the key is broken.

Cutlery

Fifteen artifacts represent metal cutlery for food preparation and consumption. Six different forms occur including serving fork, table fork, table spoon, tea spoon, unidentified table service with cast iron handles, and kitchen knife (Table MF.5).

Serving Fork (1)

A two pronged, iron serving fork, termed "slicer fork" in an 1865 catalogue (APT 1980:355-356), is a composite utensil represented only by the shank and prong sections (Fig. 10J). The round tang would have been inserted in a wood or bone handle. The surviving element is 3.6 inches long and .65 inch wide at the prongs.

Figure 10. Cutlery. A) Iron tablespoon bowl. B-C) Forged iron knife handles. D-E) Cast iron handles. F) Pewter Windsor-style handle. G) Brass back-turning fiddleback handle. H) Pewter mid-rib handle. I) Pewter back-turning fiddleback handle. J) Iron flesh fork. K) Iron table fork. L) Misshapen brass spoon with back-turning fiddleback handle.

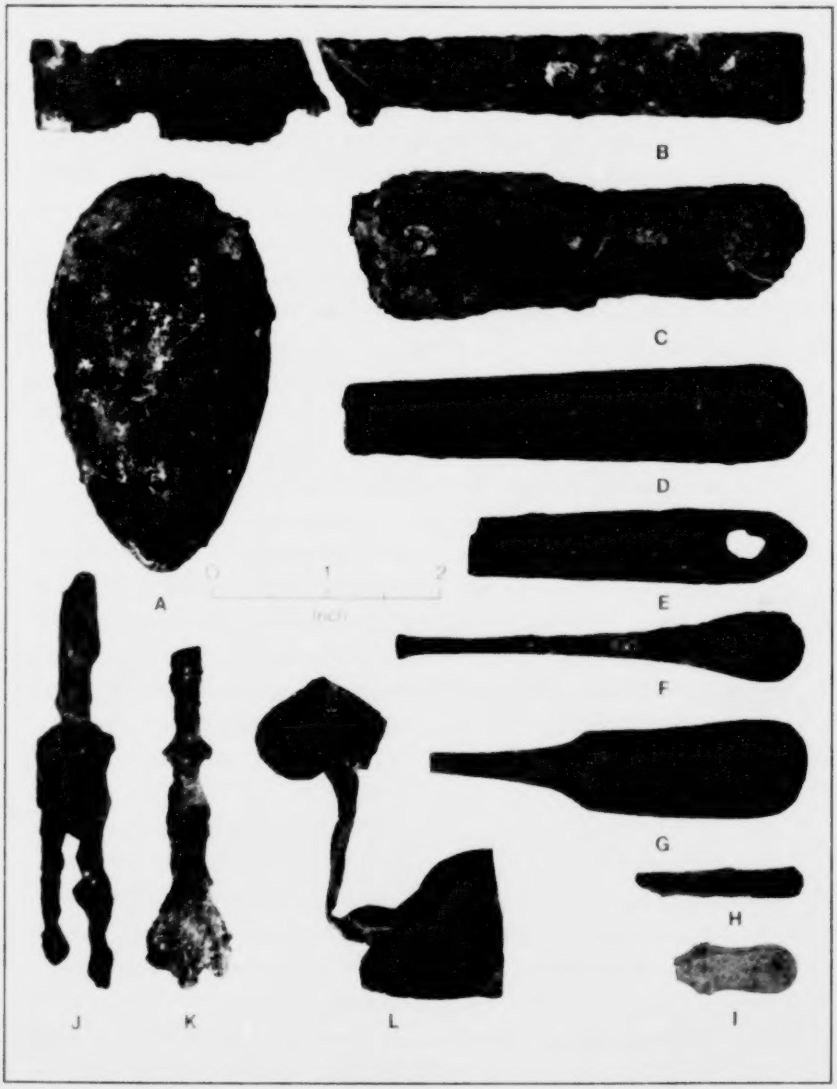
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Table Fork (1)

A three tined fork of composite construction is represented by tang, shank, and prong sections (Fig 10K). The iron utensil exhibits a round tang to fit into a socketed wood or bone handle. An integral bolster defines and separates the tang from a shank that is contoured like the "hotel and kitchen fork" in an 1895 catalogue (Montgomery Ward 1895:447). The fork is .75 inch wide at the prongs and from bolster to tine is 2.1 inches long. Overall length of the fork is 2.95 inches.

Table Spoon (2)

Two large iron spoon bowls are from table spoons (Fig. 10A). One is 1.88 inches wide and 3.3 inches long. The second specimen is 1.68 inches wide and 3.05 inches long. Tinned iron table spoons were marketed in 1865, along with tinned [illegible] tea spoons, table forks, basting spoons, and flesh forks (APT 1980:[illegible] he serving fork and table fork previously described were probably finished [illegible] tin. Tinned cutlery continued to be manufactured through the nineteenth century for "tinned steel" table service was available in 1902 (Sears and Roebuck 1902:482).

Tea Spoon (6)

Six tea spoons in the sample are relatively small spoons represented by four handles, one bowl, and one complete specimen. Pewter and cuprous metals occur in equal numbers among the tea spoons. The copper or brass spoons were probably once electroplated.

Three spoon handles are pewter. The first is a windsor-style back-turning andle that is 3.5 inches long and .63 inch wide (Fig. 10F). Another is a flat back-turning fiddleback handle with cast, threaded edge and floral motif (Fig 10I). These spoon types are common in the 1820-1840 time range (Montgomery 1978:157). A third pewter spoon is represented by a mid-rib handle that tapers uniformly from proximal to distal ends (Fig. 10H). The widest point on the handle, at the proximal end, is .3 inch wide. The mid-rib style is typical of the second half of the eighteenth century and is commonly used in conjunction with a round spoon bowl and rattail (Montgomery 1978:158-159). Discounting the mid-rib handle, pewter spoons at Fort Smith probably date to the first half of the nineteenth century. By 1865, Brittania, a harder lead/tin alloy was being exclusively marketed by the Russel and Erwin Company, and then only in larger hollow-ware forms (APT 1980:344).

Three tea spoons of cuprous base metals are represented by a spoon bowl, a spoon handle, and one complete specimen. The spoon bowl is fragmentary and unmeasurable. The spoon handle is from a tipped, flat back-turning fiddleback-handle spoon (Fig. 10G). A third and complete spoon of cuprous base metal is so misshapen that measurements are not possible. Likewise, a company logo embossed on the back of the handle is not legible. Formally, however, it is a plain spoon with a flat fiddleback-handle (Fig. 10L). The fiddleback-handle is a typical nineteenth century cutlery form. In 1865, the Russel and Erwin Manufacturing Company offered identical silver plated spoons and forks, both in plain or tipped fiddleback styles (APT 1980:341).

Cast Iron Handled Cutlery (2)

A possible knife and fork are represented by cast iron handles (Fig. 10D-E). Both are similar handles of different sizes and may indicate a set. In appearance, the specimens are hollow, cast iron handles with recessed sides. The first .85-inch wide handle tapers uniformly to a .8-inch wide bolster. The handle is .29 inch thick and 4.05 inches long. The second handle is similarly constructed but has a pointed proximal end that is .6 inch wide. This handle tapers uniformly to a .55-inch wide bolster. This specimen is .21 inch thick and 2.95 inches long. Its recessed sides contain a company logo that, because of corrosion, is illegible. The 1902 Sears and Roebuck catalogue (1902:477) illustrate knives and forks with similar iron handles. Because the Sears products are eating utensils, the two examples from Fort Smith are believed to be for table service--possibly a knife and fork. Iron handled cutlery was not offered for sale in an 1895 catalogue (Montgomery Ward 1895) and so the Fort Smith specimens probably postdate the military occupation.

Kitchen Knives (3)

Three iron knives in the collection are from kitchen knives used in food preparation. In the absence of formal table knives, however, these kitchen-style knives may also have been employed at the table. One knife is represented by the tip of an iron blade and is .55 inch wide. Another knife, represented by a wood-slat handle, is a butcher knife (Fig. 10C). Three brass rivets hold the wooden slats to a flat iron tang. The 3.55-inch long handle is .9 inch wide at the proximal end. The handle tapers uniformly to a .785-inch wide distal end, without bolster. A third knife is indicated by a portion of tang and blade from a butcher-style knife (Fig. 10B). The flat tang, for composite slat handles, is 3.7 inches long. The handle has a .75-inch wide proximal end that tapers uniformly to a bolsterless, .6-inch wide distal end. The blade is .87 inch wide.

Utilitarian Stonewares (513)

Stoneware vessels are typically large, thick bodied, utilitarian containers for storing staples or pickling and salting foods. Stoneware production in the United States originated after the American Revolution. These durable wares were produced over the following century but were mostly out of production by ca. 1900 (Ramsay 1939:128-138). Common vessel forms include the crock, jar, churn, jug, and bowl. Stonewares are rendered impervious to liquids by intense firing and by the application of slips and glazes. These waterproof coatings are varied, but basic types include the Albany slip, a reddish brown-to-coffee brown clay wash; bristol slip, a white clay wash; manganese glaze, a shiny black glaze used infrequently on jugs and bean pots (Viel 1977:12); various smooth and clear-to-colored glazes that are alkaline or lead based treatments--both impart a shiny glass-like quality to vessels (Ketchum 1983:19); and salt glaze, also alkaline, but applied during the firing process. Salt, used as a fluxing agent, produces a clear but dimpled glaze on vessel surfaces. Vessel colors with salt glazes or clear glazes vary depending on the color of the underlying paste. Thus, such vessels are color pasted.

The Fort Smith collection contains 513 stoneware sherds (Table MF.6). A great deal of variation in paste and surface treatment is evident. Seven paste colors occur including beige, grey, orange, red, brown, white, and yellow. Many of these color differences can be attributed to differential firing. An oxidizing atmosphere produces brown colors whereas an oxygen poor atmosphere results in grey colors (Shepard 1963:16-24). Single sherds often range in color from beige-to-red and from orange-to-beige-to-grey. Some 20 variations in surface treatment are apparent (Table 5). Most sherds have an albany slip (60.9%), usually on the interior surface in conjunction with a different exterior treatment. A minor percentage of the sample (1.2%), however, does have an albany slip on both surfaces. On the remainder, exterior surfaces are salt glazed (35.6%) or have some form of alkaline or lead glaze in varying colors (24.1%). The remaining 39.1% of stonewares exhibit an array of glazes. Vessels with unglazed interiors, perhaps to promote cooling through evaporation, are well represented (21.5%). These have lead, alkaline, or salt glazed exteriors. An additional 16.6% reflect various combinations of salt, alkaline, and lead glazes on both surfaces. Three sherds exhibit a manganese glaze (.6%) and two others a zinc-based Rockingham glaze (0.4%). Although Rockingham glazes usually appear on kitchenwares, these have been included in stonewares because of their unusual thickness and paste hardness. Plain vessels, having no slip or glaze at all, account for 3.5% of the sample. White bristol slips, abundantly represented among ginger beer bottles in the collection, are noticeably absent on other utilitarian stoneware containers.

Based on variation in glaze and slip, a minimum of 20 utilitarian stoneware vessels are present. Because of the small size of the sherds, however, only 12 vessels can be formally identified. Five sherds in the sample are from three bowls. Bowls are wide orifice vessels with broad collar rims. One bowl exhibits a clear glaze, another an albany slip interior with clear glazed exterior, and the third specimen is unglazed. Two white pasted rimsherds with albany slip interior and yellow glazed exterior are from the same vessel--a churn. This formally distinct container exhibits rounded shoulders, a constricted neck, a large orifice, and rounded rim that is recessed for a lid. Most formally

TABLE 5

Utilitarian Stonewares by Glaze

Glaze (Int/Ext)	#	%
Salt/Salt	22	4.3
Unglazed/Salt	89	17.6
Clear/Salt	2	.4
Albany/Albany	6	1.2
Albany/Brown	4	.8
Albany/Clear	27	5.3
Albany/Salt	180	35.6
Albany/Unglazed	51	10.0
Albany/Yellow	40	8.0
Clear/Clear	14	2.8
Green/Green	9	1.8
Manganese/Manganese	1	.2
Manganese/Salt	2	.4
Rockingham/Rockingham	1	.2
Clear/Rockingham	1	.2
Brown/Clear	27	5.3
Brown/Brown	10	2.0
Unglazed/Brown	1	.2
Unglazed/Clear	1	.2
Unglazed/Unglazed	18	3.5
Total	506	100.0

identifiable sherds, however, are from crocks (64%). At least eight such vessels are indicated. Crocks vary widely in paste and glaze. Colors represented include orange, white, beige, red, and grey. Two examples are unglazed. Three crocks have an albany slipped interior with salt and alkaline glazed exteriors. Two crocks are entirely salt glazed and another exhibits a clear alkaline glaze on both surfaces. Two red stoneware sherds with a brown lead glaze are from the same vessel, a canning jar. This specimen is a relatively small, cylindrical vessel with rounded shoulders and a wide orifice surrounded by a groove. Such canning jars were sealed with cheese cloth and wax or lard.

Utilitarian stoneware vessels occur in limited forms at Fort Smith but are well represented. The wide range of variation within the sample probably reflects the lengthy occupation of the site and different centers of stoneware production. A lack of identifying hallmarks on the recovered sherds, however, prevents an assignment to factory or district.

Ceramic Product Containers

Beer Bottle (172)

From ca. 1850-1900, "ginger beer bottles" were made by nearly every stoneware manufacturer in the United States (Ketchum 1983:72). Designed to hold ginger beer, ale, or stout, the popular container is widespread and formally diverse. Beer bottles from Fort Smith, however, appear remarkably uniform (Table MF.7). All 172 sherds are from wheel thrown, stoneware bottles with flat bases, cylindrical sides, and sloping shoulders that gradually restrict to short necks. A broad collar over ring lip constitutes the finish. The bottle exterior exhibits a white Bristol slip (Ketchum 1987:12). The neck and shoulder region is coated with a yellow colored glaze.

Shaving Soap Jar (3)

Three clear glazed, white earthenware sherds represent the same vessel--a ceramic shaving soap jar (Fig. 11A-B, Table MF.7). Formally, the container is a circular jar with vertical sides and a footring base. A portion of a black transfer printed label, "---DELPHI---/---EL N---/---," is evidently a manufacturer's mark. Similar but more complete shaving soap containers have been recovered at Fort Washita for "Taylors' Saponaceous Shaving Compound," produced ca. 1851-1875. The firm of H.P. and W.C. Taylor operated in Philadelphia (Lewis et al. 1975:161).

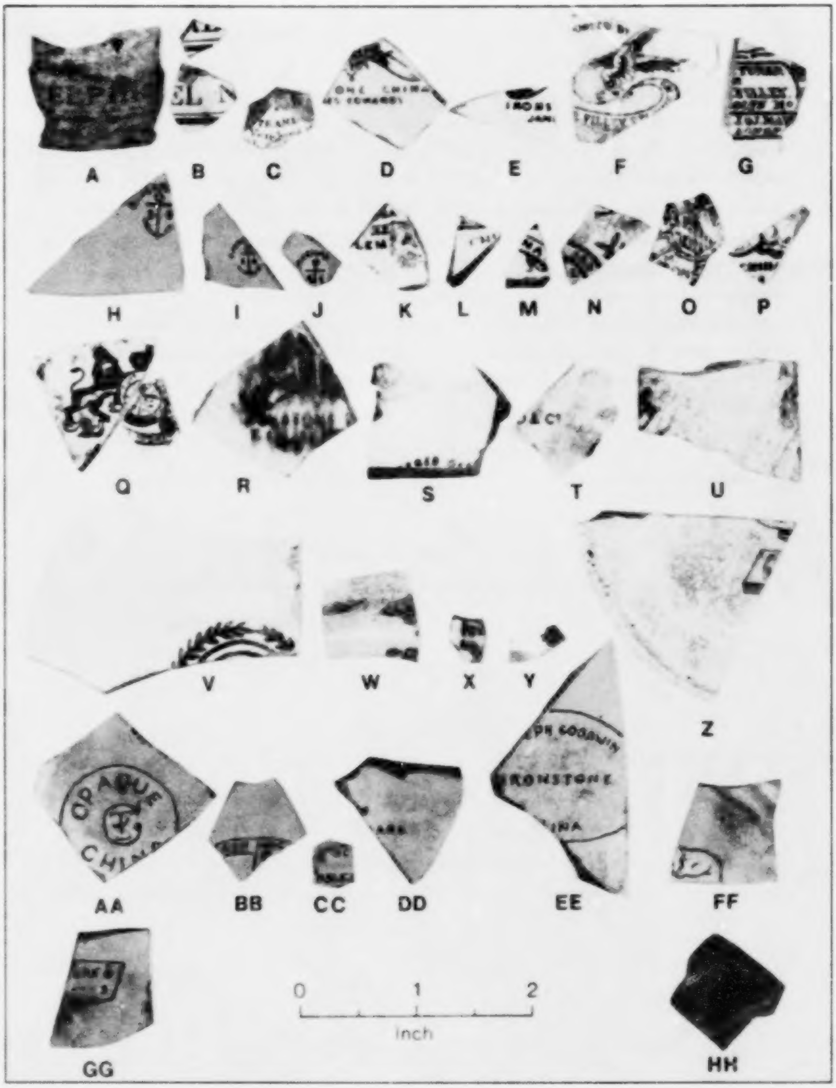
Unknown Product Container (1)

A single sherd from a white pasted, clear glazed, earthenware vessel is present (Fig. 11C, Table MF.7). Curvature of the specimen suggests a small bottle or jar form. A brown transfer printed label occupies the surface, "---TRAND/VENDERSO---," and indicates a marketed product. Contents of the container, however, are unknown.

Ceramic Kitchenwares

One hundred eighty-four sherds are unrefined earthenwares (Table MF.8), vessels usually intended for food preparation and serving (Ketchum 1987:9). These were often sold in sets that included mixing bowls, pans, pitchers, etc. Based on variation in paste, two types of kitchenwares are recognizable: redwares and yellowwares.

Figure 11. Manufacturer's Marks. A-B) Black transfer printed mark from "Taylor's Saponaceous Shaving Compound ca. 1859-1875; C) Unidentified brown transfer printed mark on a product container; D-E) Black transfer printed marks from the James Edwards Company of Burslem, 1842-1851; F) Blue transfer printed mark of R. Filley, a St. Louis importer who operated from 1851-1864; G) Black transfer printed mark from the John and Joseph Mayer Company of Longport, 1843-1855. As this mark indicates, the vessel was manufactured for R. Filley and so, dates from 1851-1855; H-J) Three impressed marks of the Davenport Company manufactured in 1836, 1856, and 1844. The 1836 mark occurs on a pearlware vessel; K) Black transfer printed mark from an unidentified company of Burslem; L-Q) Unidentified black transfer printed marks; R) Unidentified flown blue transfer printed mark; S-W) Unidentified black transfer printed marks; X) Unidentified green transfer printed mark; Y) Unidentified black transfer printed mark; Z) Unidentified purple transfer printed mark; AA-GG) Unidentified impressed marks; HH) Unidentified impressed mark on an ink bottle.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Redwares (21)

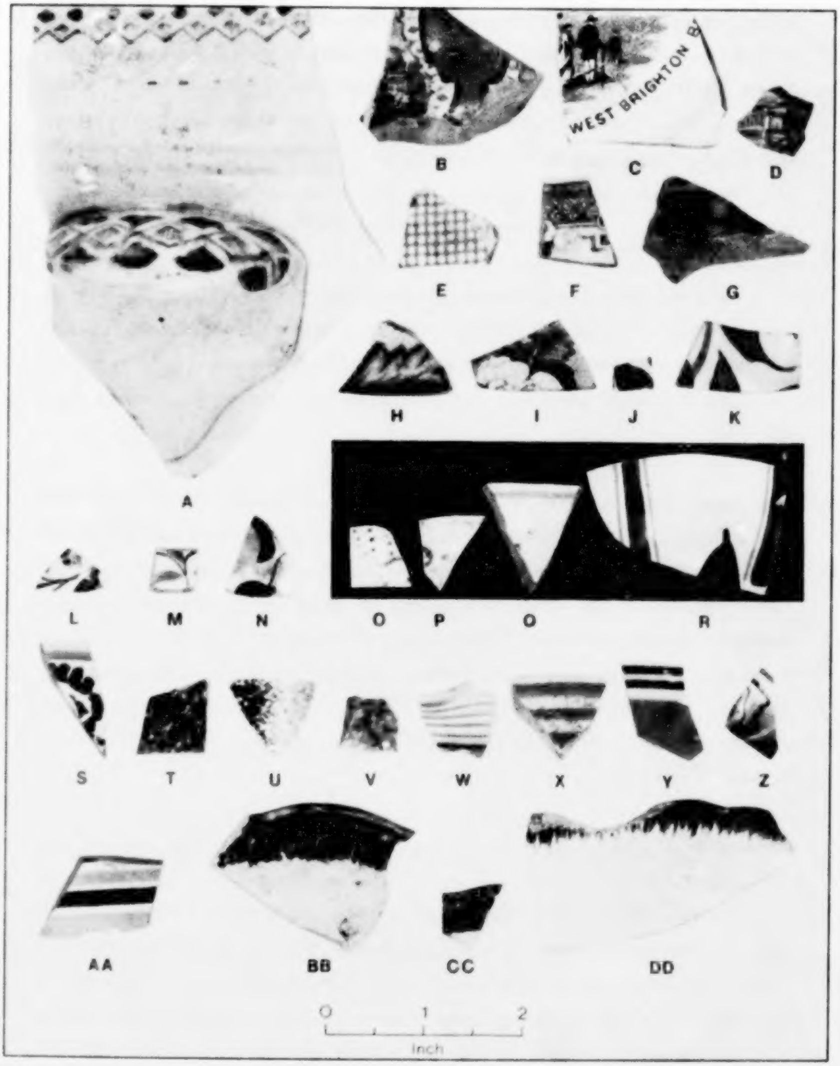
An American produced ceramic, "redwares" are common on sites dating from 1750-1900 (Ramsay 1939:128-138). Twenty-one redware sherds were recovered at Fort Smith that represent a minimum of five vessels. Five different glazes or glaze combinations appear--all are apparently lead based treatments (eg. Majewski and O'Brien 1984:21). Clear glazes are most common (14), followed by green (3), brown (2), yellow/unglazed (1), and clear/brown glazed sherds (1). Although the sherds are too small to be formally identified, most redwares are bowls.

Yellowwares (163)

Unrefined earthenwares of yellow colored clays were produced in the United States from ca. 1830-1900 (Ramsay 1939:23). Early examples of yellowwares were finished with a clear lead based glaze but that was soon supplanted with the benign alkaline glaze. Other vessels were sealed with a Rockingham glaze, a mottled brown, manganese or zinc based glaze (Majewski and O'Brien 1984:21). Yellowware vessels were often elaborately decorated with a combination of molded design--made possible by casting--and annular designs ranging from slip banding to dendritic mocha elements.

The 163 yellowware sherds in the collection represent a minimum of 11 vessels. Two types of glazes occur among yellowwares: Rockingham and clear. Twenty-two sherds exhibit the mottled brown Rockingham glaze on at least one surface. With the exception of two sherds with a molded design, these vessels were otherwise undecorated. Both molded sherds appear to be from a figural container similar to the "coachman bottle" that was produced ca. 1849-1858 by the U.S. Pottery company of Bennington, Vermont (Ketchum 1987:138). Other yellowware vessels with the Rockingham glaze are not formally identifiable. The remaining 138 yellowware sherds are all clear glazed, six of which can be

Figure 12. Ceramic Designs. A) Slop jar rim with transfer printed design. B-D) Scenic transfer printed designs. E-F) Abstract transfer printed border designs. J-K) Hand painted broad floral designs. L-N) Hand painted sprig designs. O-P) Luster purple sprig motif on porcelain. Q) Handpainted borderline. R) Handpainted vertical line design. S) Cut sponge/stamped design. T) Plain sponge/spatter design. U) Striped sponge/spatter design. V) Sponge/spatter design with handpainted sprig motif. W) Creamer rim with rouletted border design. X-Y) Annular wares with slip banding. Z) Marbled or "worm" design on annular ware vessel. AA) Slip banding on yellowware vessel. BB) Dot and plume edge molding. CC) Bead and shell edge molding. DD) Shell edge molding.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identified as bowls. Thirty-seven sherds are decorated. Two exhibit molded designs--probably the melon ribbed body typical of many yellowware bowl forms. Thirty five sherds are slip banded. These display bands of brown, white, and blue colors; and alternating bands of brown/white, black/white, and red/white colors (Fig. 12AA).

Ceramic Tablewares (6,265)

Relatively thin, white pasted ceramic containers, usually with elaborate decoration, are intended for table service. A total of 6,265 ceramic sherds recovered at Fort Smith are tablewares (Table MF.9).

Paste and Glaze

Only 331 sherds or 5.3% of all tablewares are porcelain--the remainder are earthenwares/ironstones. Among the earthenwares/ironstones, 5,701 sherds were identified by glaze. These are overwhelmingly clear glazed (95.4%). Pearlwares (3.8%) and creamwares (.6%) are only minor components of the ceramic assemblage. Other pigmented glazes that can not be placed within these basic ware groups are sherds with brown (4), green (4), blue (1), and pink/blue (1) glazes. Two hundred thirty-three sherds could not be identified by glaze. The surfaces of 23 sherds are completely exfoliated and 210 sherds are burned beyond recognition.

Decoration

Only 1406 or 22% of all tableware sherds are decorated (Table 6). This does not imply a high frequency of plain vessels. Most unembellished sherds are from blank areas of decorated vessels. Decorations represented include transfer printed, hand painted, sponge/spatter, annular, and relief decorated vessels. Completely plain vessels, popular during the late nineteenth century, are also considered a decorative form. Only large sherds without applied or molded decoration, however, were classified as plain.

Transfer Printed.

Most decorated vessels (36.3%) are transfer printed (Fig. 12B-I). Together, blue and light blue transfer designs comprise an overwhelming 67.6% of all transfer prints. Other colors occur less frequently and include flown blue (11.8%), red (4.7%), brown (4.5%), black (4.3%), purple (4.1%), green (2.4%), and multi-colored prints (.6%). Three sherds with multi-colored transfer prints include green/brown, light blue/green, and black/red color combinations. Although blue transfer prints also occur in conjunction with clear glazes, all transfer prints on pearlwares are blue. Other colored transfer prints occur exclusively on whitewares.

A total of 136 transfer printed sherds were too small for pattern identification. The remaining sherds, however, indicate that 105 patterns are floral while 67 sherds incorporate scenic or landscape subjects. Abstract or geometric patterns, probably from distinctive border regions, occur on 106 sherds. Fourteen specimens or 2.7% of all transfer printed sherds also displayed a second decorative form. Two such sherds are handpainted and twelve others exhibit relief molding.

Annular

Annular or mocha decorations occur in a variety of patterns. Bands of slip, usually placed on a white background, encircle these vessels. Wide zones of color separate annular decorations. These were left plain or became the backdrop for additional embellishments such as the "worm" or finger swirled, combed, and dendritic fern patterns. On some vessels, rouletting or engine turning creates bands of relief decoration that adorn vessel borders.

The collection contains 174 sherds from annular decorated vessels (Fig.

12X-Y). Most or 128 sherds display the characteristic slip banding in brown, yellow, blue, green, and white colors--often intermixed. Five sherds exhibit the worm pattern in brown, orange, and green colors. One sherd with combed decoration has brown, red, white, and blue layers of slip exposed. Three sherds exhibit the dendritic fern pattern, typical design element of mocha wares. One other sherd harbors a roulletted decoration that consists of parallel grooves encircling the vessel rim.

Sixty-one sherds with annular decoration also reveal a colored exterior. These backgrounds are primarily blue (52), green (6), and yellow (3). Thirty-six other sherds lacked distinctive annular decoration but displayed a colored exterior surface. It is likely that they are body sherds from annular wares.

Hand Painted

Some form of hand painted decoration occurs on 277 sherds. Seventy-two handpainted sherds are too small to be identified by pattern. The remaining sherds have broad floral, sprig, borderline, and vertical line patterns (Fig. 12J-R).

Sixty-five sherds exhibit a hand painted broad floral pattern. Twenty-seven patterns are blue and the remaining 36 are polychrome. The polychrome patterns include several colors: orange, green, brown, red, blue, black, light blue, pink, yellow, and luster purple are represented. Fifty-two sherds have a fine line floral or sprig motif. At Fort Smith, this pattern is always rendered in polychrome and includes: orange, green, brown, black, red, blue, or yellow colors. Gold and purple luster are used infrequently as design colors. Sixty-eight sherds exhibit only a hand painted borderline on vessel rims. Many broad floral and sprig patterns, however, occur in association with borderlines. Yet, vessels with the borderline as a sole design element have been recovered elsewhere. Thus, the 68 sherds with borderline may constitute a distinctive pattern. Six sherds exhibit hand painted stripes oriented vertically from vessel base to rim. One

TABLE 6

Ceramic Tablewares by Glaze and Decoration

Decoration	Burned	Cream	Pearl	Clear	Total
Annular					
Slip Banded		4	4	120	128
Worm/Swirled		1		4	5
Combed				1	1
Roulletted		1			1
Dendritic		2		1	3
Indeterminate		2	2	32	36
Sponge/Spatter					
Cut/Stamped				6	6
Mottled			1	13	14
Plain			5	76	81
Stripe			1	23	24
Sponge/Handpainted					
Cut/Borderline				12	12
Plain/Sprig				2	2
Sponge/Molded					
Plain/Beaded				1	1
Handpainted					
Broad Floral (Blue)	1		1	25	27
Broad Floral (Poly.)	2		1	33	36
Sprig (Poly.)	2		8	36	46
Sprig (W/Purple Luster)				3	3
Sprig (W/Gold Luster)				1	1
Borderline Only	2		5	59	66
Borderline (Gold Luster)				2	2
Vertical Line			5	1	6
Indeterminate	5	1	5	61	72
Transfer Printed					
Blue	1		12	184	197
Light Blue	4			134	138
Black	1			20	21
Purple	1			19	20
Red				23	23
Green				12	12
Brown				23	23
Flown Blue				60	60
Green/Brown				1	1
Light Blue/Green				1	1
Black/Red				1	1
Transfer Print/Handpainted					
Black				1	1
Blue				1	1

TABLE 6 (Cont'd.)

Ceramic Tablewares by Glaze and Decoration

Decoration	Burned	Cream	Pearl	Clear	Total
Transfer Print/Molded					
Blue/Unknown			1	1	2
Purple/Flat Panel				1	1
Blue/Flat Panel				1	1
Flown Blue/Flat Panel				1	1
Light Blue/Flat Panel				4	4
Blue/Fluted				1	1
Light Blue/Recessed Rim				1	1
Red/Unknown				1	1
Molded/Handpainted					
Boss/Broad Floral				1	1
Floral/Broad Floral				4	4
Floral/Gold Luster Hilight				1	1
Floral/Sprig				1	1
Indeterminate			2	2	4
Molded					
Bead & Shell (Blue)				2	2
Shell (Green)			1	9	10
Shell (Blue)			10	104	114
Shell (Plain)				3	3
Dot & Plume (Blue)			1		1
Beaded		1	1		2
Scalloped				5	5
Recessed Rim	1			11	12
Recessed Rim/Panel				1	1
Recessed Rim/Fluted			1	2	3
Panel	1		2	44	47
Fluted	2		2	11	15
Ribbed	2			9	11
Floral	1			8	9
Boss (Blue)				2	2
Boss (Plain)				3	3
Alphabet				2	2
Indeterminate			4	41	45
Plain					
Plain				24	24
Total	26	12	75	1293	1406

whiteware sherd displays a green vertical stripe and five sherds from a pearlware vessel have a broad blue stripe enclosed by two parallel, thin red lines. A similar sherd from the Missouri Ozarks displays the blue and red stripe pattern but as a border element (Majewski and O'Brien 1984:113). The vertical stripe pattern is uncommon.

Eighteen hand painted sherds also exhibit some other form of decoration. One sherd with a black borderline has a transfer printed design of the same color. Hand painted borders are evident on one sponge/spatter decorated sherd and on five sherds with cut sponge designs. Eleven sherds with handpainted designs also exhibit molded or repousse' decoration. Identifiable patterns include gold luster used to highlight a molded floral design; a sprig motif and four broad floral designs that are superimposed over molded floral elements; and one sherd that has a broad floral pattern over a molded boss design.

Sponge/Spatter.

Sponged or spattered decoration is evident on 140 sherds in the collection. These occur in two designs: sponge/spatter and cut sponge (Fig. 12S-V).

Three sponge/spatter patterns are recognizable: plain, stripe, and mottled. Plain sponge/spatter sherds (84) exhibit a single solid color and are red, light blue, blue, green, purple, or brown. The stripe pattern consists of two or more nonoverlapping colors applied in vertical zones. Twenty-four sherds are decorated in this manner with red/blue, purple/blue, and brown/black color combinations. Mottled sherds exhibit two overlapping colors. Fourteen sherds have mottled colors in three combinations: blue/red, purple/blue, and green/blue. Eighteen sherds exhibit cut sponge or stamped decoration. Only one sherd, however, is large enough for pattern identification--it is a flower. Cut sponge decorations are red, blue, green, and purple.

Fifteen sherds with sponge decoration are also associated with a second form of embellishment. One sherd has a sponge/spatter pattern over a beaded repousse' design. Twelve sherds with stamped or cut sponge decoration exhibit hand painted borderlines. Sponge decorated forms sometimes contain elaborate freehand center decorations. Two sherds in the Fort Smith collection indicate the presence of such decorations--they portray the handpainted sprig motif overlapping a sponge/spatter decorated border. The absence of this decorative form elsewhere in the Ozarks (eg. Majewski and O'Brien 1984:44; Price 1982:19) is probably a sample bias. Handpainted sherds from the well of a sponge decorated plate would be classified as sprig or broad floral. Only rarely will a sherd contain both patterns.

Molded (Repousse')

Molded designs are evident on 287 sherds. Forty-eight sherds, however, could not be assigned to a specific pattern. The remaining 239 sherds incorporate popular styles of edge, border, and body molding. Fifteen different patterns are recognizable.

Nine varieties of edge molding occur (Fig. 12BB-DD) that include bead and shell with blue border (2), shell edge with green border (10), shell edge with blue border (114), plain shell edge (3), dot and plume with blue border (1), plain beaded edge (2), boss with blue border (2), plain boss (3), and recessed rim (16). In reality, recessed rims are probably small sherds from otherwise panelled or fluted vessels. These often have a groove or raised bead as a border element. Three sherds in the collection do display recessed rims in conjunction with flutes or panels.

Six patterns of body and border molding have been recognized (Fig. 13A-G). Two sherds from the same plate portray the alphabet with letters adorning the vessel border. Other molded patterns can occur on both border and body regions. These include panelled (48), fluted (18), ribbed (10), floral (10), and scalloped (5) patterns.

Twenty-four sherds with molded designs exhibit a second form of decoration. One sherd with a beaded edge also portrays a plain sponge pattern. Twelve molded sherds have transfer printed designs including seven panel forms, one fluted form, one recessed rim, and two unidentified molded designs. Eleven molded vessel sherds contain handpainted designs. Seven are identifiable to pattern and include six relief floral designs and one molded boss. These are used in conjuction with handpainted sprig and broad floral patterns or in one case, with gold luster to highlight the molded design.

Plain

Plain wares, completely unembellished by any applied or molded decoration, became popular during the late nineteenth century. In fact, the simple lines and stark appearance of this ware constitutes a decorative class by itself. Twenty-four sherds in the collection are large enough to be classified as plain vessels.

Form

Vessel forms at Fort Smith are typical of those consistently recovered in the Ozark border region of Missouri (Price 1982:23; Majewski and O'Brien 1984:75-99) and elsewhere. At Fort Smith, 549 ceramic sherds are formally identifiable. The plate is a major component of the assemblage, accounting for 344 or 62.5% of all formally identifiable sherds. In decreasing frequency is the bowl (81/14.7%), cup (74/13.5%), saucer (33/6.0%), platter (9/1.6%), tureen (3/.5%), pitcher (2/.4%), mug (1/.2%), creamer (1/.2%), teapot (1/.2%), and bone dish (1/.2%). Only the bone dish is atypical in period assemblages. It is a heavy, plain ware that is probably a late nineteenth century product.

Dating Ceramic Tablewares

A semiclear lead glaze was developed in the late 1750s. When applied to white pasted ceramics, the natural tint of this glaze produced a yellowish colored ware called Queensware or creamware.

In 1780, Josiah Wedgewood applied cobalt to this lead based glaze to disguise the yellowish hue of the ware. The resulting product, with bluish-green cast, gained widespread popularity. By 1820, production of the new ceramic, known as pearlware, had eclipsed creamwares (South 1977:211-212). The development of a clear alkaline glaze in 1820, resulted in a whiter, more durable ware. Within a decade, whitewares had all but replaced pearlwares. The transition between the two glazes is approximately 1830 (Lofstrom et al. 1982:4-8; Price 1982:18). By 1840, pearlwares are no longer evident in the archeological record--at least at one site in the Ozark border region of Missouri (eg. Majewski and O'Brien 1984:22).

Stylistic variation in ceramic decoration provides an excellent dating tool. Before 1820, all transfer printed designs were rendered in blue. Other colors could not withstand the high firing temperatures that a lead based glaze required. In that year, the development of a clear alkaline glaze made it possible to fire ceramics at temperatures that would not distort transfer printed designs in other colors. By 1828, red, brown, and green colors were being used on transfer printed wares (Majewski and O'Brien 1984:34). About 1830, black, purple, and a light blue were added to the color palette. Multi-colored transfer prints first appeared ca. 1840 and flown blue designs were marketed in the United States in 1844 (Esarey 1982:184). Colored transfer prints enjoyed distinct periods of popularity in the tableware market. Archeological evidence suggests that red, brown, green, and black designs are nearly absent on sites occupied after 1850, and a mere decade later, other colors seemingly disappear from the archeological record (Lofstrom et al. 1982:9; Price 1982:27; Majewski and Obrien 1984:35).

The abrupt demise of transfer printed wares can be explained by a protective tariff instituted by the United States Government in 1862. Designed

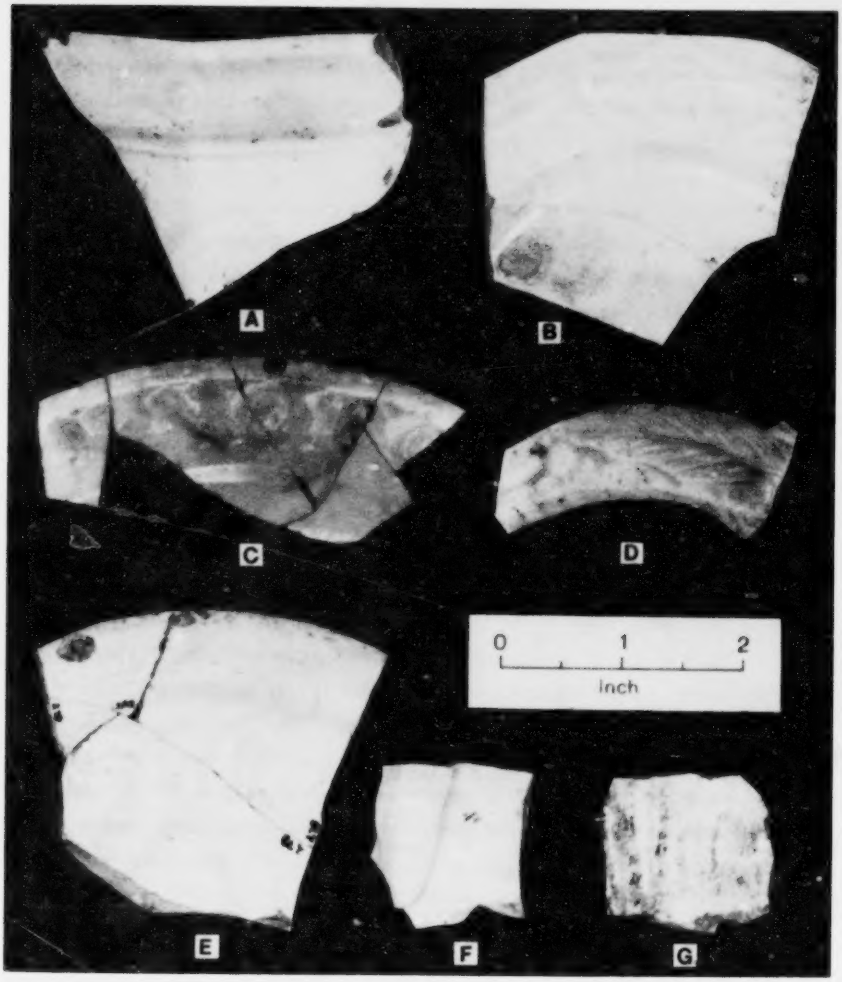


FIGURE 13. Ceramics with molded designs. A) Octagonal panel container; B) Octagonal panel plate rim; C) Alphabet plate rim; D) Molded floral bisque handle; E) Undecorated bone dish; F) Vine or floral loop handle; G) Ribbed decoration on pitcher/ewer rim.

to break the stranglehold in which the British ceramic industry kept American producers, the tariff placed a 35% duty on all imported ceramics with applied decoration (Guilland 1971:72 in Esarey 1982:161). Other applied decorations suffered the same fate.

Annular decoration occurred on creamwares as early as 1780 (South 1977:212). This form of embellishment remained popular on American tablewares, probably until 1862. However, annular decorated yellowwares made by American companies remained popular for kitchen use for decades.

Like transfer prints, hand painted designs experienced a long period of popularity on American tablewares. Underglaze blue hand painting was applied to pearlware as early as ca. 1780 (South 1977:212). The broad floral pattern or "gaudy Dutch" design (Cole 1967:89) and the sprig pattern occur in archeological contexts as early as 1810 (Majewski and O'Brien 1984:41; Lofstrom et al. 1982:6). Hand painted decoration remained popular and persisted on whitewares until 1862.

Sponge/spatter decoration may date as early as 1820 (Cole 1967:89). Seven sherds in the Fort Smith collection with sponge/spatter decoration are definitely pearlwares and probably predate 1830. The cut sponge process for stamping designs originated about 1845 (Majewski and O'Brien 1984:44) and all sherds in the collection with this form of decoration are whitewares. All sponge decoration on tablewares is expected to have ended abruptly in 1862 when a protective tariff was placed on imported ceramics with applied decoration.

Edge molding occurred on creamwares as early as 1780 (South 1977:212). This form of decoration, often with applied bands of color, was popular on pearlwares and then whitewares until 1862. Edge molding without colored borders first appeared ca. 1840 (Lofstrom et al. 1982:10; Price 1982:22), about the same time that other molded designs occur without transfer printing or hand painting (Wetherbee 1980:37). Although not well documented in the archeological literature, the development of these "white ironstones" is traced in a popular book on the subject (Wetherbee 1980). The following history of plain and molded wares is derived from this work.

A simple "gothic" style of all white ironstone appeared ca. 1840 that emphasized octagonal and hexagonal-shaped vessels with flat or fluted panels. Plain finials adorned vessel covers and were definitely knob-like in appearance. With registration of the Sydenham shape in 1855, graceful floral elements were incorporated into the gothic style repertoire. In 1856, the "scalloped decagon," potted by Davenport, introduced a 10-fluted vessel with scalloped panel edges. But by the mid-1850s, relief floral designs spilled over from handles to include vessel borders and rims. This period of realistic relief molding, from ca. 1855-1870, can be described as a rococo style. Grain, fruit, flower, and vine arrangements adorn round bodied vessels. Finials are shaped like flowers or fruit, or are entirely replaced by a looped vine handle. Even open spaces are filled with repetitious designs. Ribbing first appeared in a pattern registered in 1863. In the late 1860s, Greek revival elements such as the wreath and Greek key, appear in some ironstone designs.

Although relief floral elements are retained for a time, about 1870, tastes in dinnerware revert to ceramics with simple, graceful lines. Large, intervening open spaces are the norm. Unlike the early gothic shapes, however, vessel bodies are round, square, or rectangular. By 1880, simple plain wares without any relief molding at all, dominate the market. These are relatively heavy bodied wares. In the 1890s, a revival of rococo elements occurred with the introduction of the popular "tracery pattern" by the Johnson Brothers. Their design incorporated a melon ribbed body with floral border motifs.

Although white ironstone wares with molded decoration date as early as 1840, their peak period of popularity in the United States can be placed at

1862-1894. In 1862, the United States Government placed a protective tariff upon all imported ceramics with applied decoration. The British ceramic producers replied with an aggressive strategy to market wares with molded decoration. Abruptly it seems, ceramics with applied decoration--the familiar transfer prints and hand painted wares--were replaced by all white ironstones. By 1894, when the tariff was finally lifted, transfer printed and hand painted designs reappeared (Guilland 1971:72 in Esarey 1982:161). By 1900, plain and simply molded wares were passe'.

Manufacturer's Marks

Thirty-two sherds exhibit a manufacturer's mark (Fig. 11). Only seven examples, however, may be identified to manufacturer with any degree of certainty. The remainder are too incomplete to be identified or are unreported in the literature.

Identifiable marks have known manufacture ranges. Three Davenport marks are specifically dated with an abbreviated year of production and represent the years 1836, 1844, and 1856. The 1836 mark is on a definite pearlware sherd and attests to the longevity of the lead based glaze well after the advent of whitewares. The remaining two Davenport marks are definitely on whitewares. Two marks are from the James Edwards Company and were produced between 1842-1851. A sixth mark bears an importers logo belonging to the Edward A. and Samuel R. Filley Company of St. Louis. These men operated between the years 1851-1864 (Lewis et al. 1975:231). Finally, the seventh mark, which also displays the Filley logo, contains the manufacturer's mark as well. This vessel was produced by the John and Joseph Mayer Company that operated from 1843-1855. Thus, the date of production for this backmark can be restricted to a five-year period from 1851-1855. With the exception of the 1836 mark, which could be a curated or heirloom vessel, the datable marks cover a 20-year long period from 1844-1864.

Nine marks are identifiable to country of origin. Among these, eight are British marks. A single impressed "HOTEL" mark (not illustrated), that postdates the military occupation at Fort Smith, is clearly American.

Glass Tablewares

Glass tablewares are represented at Fort Smith by 162 sherds (Table MF.10). Tablewares are manufactured by pressing molten glass into molds, a process that made a wide range of relief decoration possible. Ninety-five sherds are decorated. These reflect 10 pressed design patterns, some used in conjuction with engraving (Table 7). Additionally, nine sherds display flashing, colored glass applied to an otherwise clear bodied vessel.

TABLE 7

Glass Tableware by Decoration

Decoration	#	%
Beaded (P)	7	7.4
Stem & Leaf (P/E)	2	2.1
Diamond/Star/Fan (P)	1	1.0
Pinwheel/Strawberry Diamond/ Fern (P/E)	11	11.6
Sunburst (P)	5	5.3
Fluted (P)	46	48.5
Scalloped (P)	2	2.1
Raised Circle (P)	2	2.1
Strawberry Diamond (P)	2	2.1
Ribbed (P)	2	2.1
Unidentified Floral (P)	4	4.2
Unidentified Leaves (P)	1	1.0
Unidentified Design (E)	1	1.0
Red Flashing	5	5.3
Pink Flashing	4	4.2
Total	95	100.0

E = Engraved P=Pressed

TABLE 8

Glass Tableware by Form and Color

Form	Amethyst	Clear	Selenium	Aqua	Opaque Green	White	Total
Bowl	3	1					4
Compote	13	2					15
Plate		1					1
Tumbler	10	42	1	2			55
Wine Glass	2	10		1			13
Unidentified	5	62			3	4	74
Total	33	118	1	3	3	4	162

Eighty-eight sherds are formally identifiable. Six different vessel shapes including the bowl, compote, tumbler, wine glass, and plate are present (Table 8).

Bowls (4)

Four sherds represent a minimum of two pressed glass bowls. The first is a globular shaped vessel of amethyst tinted glass with beaded rim and pressed stem and leaf pattern. The second bowl is a cylindrical vessel with vertical walls. A single clear glass sherd from this specimen depicts a pressed diamond star fan border design (Fig. 14F).

Compotes (15)

Compotes or footed bowls are well represented in the sample. Fifteen sherds are from a minimum of four such vessels. The first compote exhibits a globular, amethyst tinted bowl with pressed pinwheel/strawberry diamond pattern. Open areas are filled with an engraved fern motif (Fig. 14G). A second compote, without pressed decoration, is an amethyst tinted, globular bowl over a hexagonal stem with knop. Two other compotes of clear glass are also represented by hexagonal stems. One is plain but the second is decorated with red flashing placed within a hollow core stem (Fig. 14I).

Tumbler (55)

The best represented glass tableware form is the tumbler (Fig. 14A-B). Fifty-five sherds are from a minimum of 18 tumblers. All are pressed glass vessels with octagonal or decagonal fluted bodies and plain, cylindrical rims. Flutes terminate in a point about 3/4 of the vessel length from base. The body expands slightly to the rim, the widest part of the vessel. At least one example each of a fire polished and ground rim is evident. With the exception of body molding, tumblers are usually undecorated. A single specimen, however, exhibits red flashing on the vessel exterior. Four colors of glass were used in tumbler production. Most are clear (42), but 10 exhibit amethyst-tinted glass, and two other sherds are aqua colored. One sherd with yellowish tint may contain selenium oxide as a decolorizing agent.

Wine glass (13)

Thirteen sherds from small, footed vessels represent wine glasses (Fig. 14K). At least three wine glasses are present. The vessels appear to have been formed by pressing into molds. A single specimen exhibits a glass pontil scar from the finishing process--probably fire polishing. One vessel foot does have

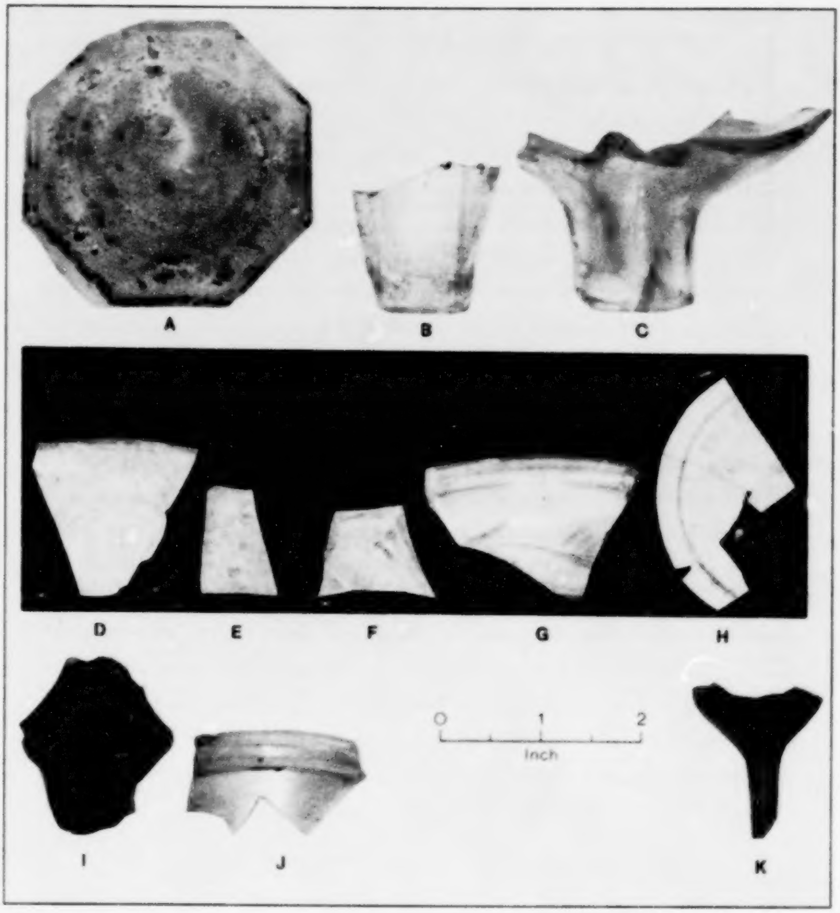


Figure 14. Glass Tablewares and Canning Jar Lid Liner. A) Tumbler base; B) Tumbler body sherd; C) Compote with plain stem; D-F) Pressed glass designs; G) Engraved fern design; H) Canning jar lid liner; I) Hexagonal stem with knop and red flashing in a hollow core interior; J) Plain bowl with bead rim; K) Wine glass.

a fire polished edge. Wine glass sherds are predominantly clear (10) but amethyst tinted (2) and aqua (1) examples are present. Wine glasses in the collection are plain or undecorated.

Plate (1)

One sherd is from a plate. The vessel is pressed from clear glass and portrays a sunburst design.

Unidentifiable Forms (74)

Seventy-four sherds are from unidentified glass tablewares. For 14 sherds, shape could not be determined. Thirty-eight sherds are from unknown cylindrical vessels and 13 flat sherds are probably from panelled or fluted forms such as the tumbler. Three sherds are from a plain, clear glass vessel with globular body and everted rim. Three other sherds are from an unusual opaque green, cylindrical vessel with a crimped rim. It appears to have been free-blown and may, in fact, be a lamp shade. Finally, another distinctive vessel is cylindrical shaped and pressed from white glass. The container surface, represented by four sherds, is decorated with pink flashing.

Glass Bottles

The glass container assemblage consists of 7,830 sherds (Table MF.10). Discounting pressed glass tablewares, an inkwell, ink bottles, medicine bottles, and lamp chimney glass which are described in other sections, 7,622 glass sherds are attributed to culinary bottles and related containers. The minimum number of specimens, based on the presence of lips, includes at least 194 bottles.

Bottle Color

Fourteen colors or shades of glass bottles are recognizable (Table 9). Several shades blend together and reflect a color continuum such as green-to-olive green-to-dark green, amber-to-brown, and blue-to-cobalt blue. For comparative purposes, the frequencies of these continuous colors have been combined. Aqua colored glass is most abundantly represented (38.2%) with green (31.1%), clear (16.0%), brown (11.1%), and amethyst tinted glass (2.4%) occurring in lesser amounts. Yellow, white, dark purple, emerald green, blue, and cobalt blue all occur in frequencies less than one percent--together they comprise only 1.2% of all bottle glass. Although color can be linked to bottle function, as a single variable, it is not a reliable indicator. In the absence of embossed logos, form is probably the best index to bottle use (eg. Wilson 1981).

Bottle Form and Function

A total of 6,332 bottle sherds are identifiable by part and shape (Table 10). In many cases, overlapping parts (i.e. lip/neck, neck/shoulder, shoulder/body, etc.) allow for the recognition of distinctive bottle forms--some functionally specific. Twelve bottle forms have been identified (Fig. 15). These include the soda bottle, canning jar, condiment jar, bitters/liquor bottle, whiskey bottle, extract bottle, patent/extract bottle, wine/champagne bottle, patent medicine bottle, prescription medicine bottle, medicine vial, and the snuff jar. The medicine bottles and snuff jar are described in their appropriate artifact groups and classes. The following eight bottle types contained potables or foods.

TABLE 9

Glass Bottles by Color*

Color	#	%
Amber	146	1.9
Amethyst	184	2.4
Aqua	2927	38.2
Blue	14	.2
Clear	1230	16.0
Cobalt Blue	8	.1
Brown	707	9.2
Dark Green	596	7.8
Emerald Green	34	.4
Green	1623	21.2
Olive Green	158	2.1
White	23	.3
Yellow (Selenium)	6	.1
Dark Purple (Black)	2	.1
Total	7658	100.0

*All glass bottles are included here. Glass tablewares, an inkwell and lamp chimney glass is excluded.

TABLE 10

Glass Bottles by Part and Form

Part and Form	#
Lip	
Bead	12
Bead W/Wide Mouth	4
Double Bead	3
Broad Collar	18
Broad Collar and Bead	4
Broad Sloping Collar	32
Broad Sloping Collar and Bead	19
Crown	5
Blob	1
Flanged	14
Plain	4
String	25
Thickened Collar	21
Thickened Collar W/Wide Mouth	1
Broad Sloping Collar W/Wide Mouth	1
Prescription	8
Flanged W/Wide Mouth	2
Interrupted Thread	1
Unidentifiable	19
	Subtotal=193
Neck	
Cylindrical	159
Leg (Bulbous)	7
Cylindrical W/Ball	6
	Subtotal=172
Neck/Shoulder	
Cylindrical	88
Leg/Oval Panel	6
Cylindrical/Figural	8
Cylindrical W/Ball & Rectangular Panel	1
	Subtotal=103

TABLE 10 (Cont'd)

Glass Bottles by Part and Form

Part and Form	#
Shoulder/Body	
Cylindrical	3925
Oval Panel	101
Figural	425
Square & Square W/Chamfered Corners	44
Rectangular Panel and Rectangular Panel W/Chamfered Corners	109
Flat (Square/Rectangular/Case)	830
Hexagonal	2
Octagonal	6
	Subtotal=5442
Body/Base	
Insweep/Kick & Kick	241
Figural	47
Octagonal	1
Decagonal	1
Rectangular Panel & Rectangular Panel W/Chamfered Corners	13
Cylindrical	96
Oval Panel	10
Square & Square W/Chamfered Corners	10
	Subtotal=419
Handle	
Unknown	1
	Subtotal=1
Bottle Stopper	
Peg	1
Ground Shaft	1
	Subtotal=2
	Total=6332

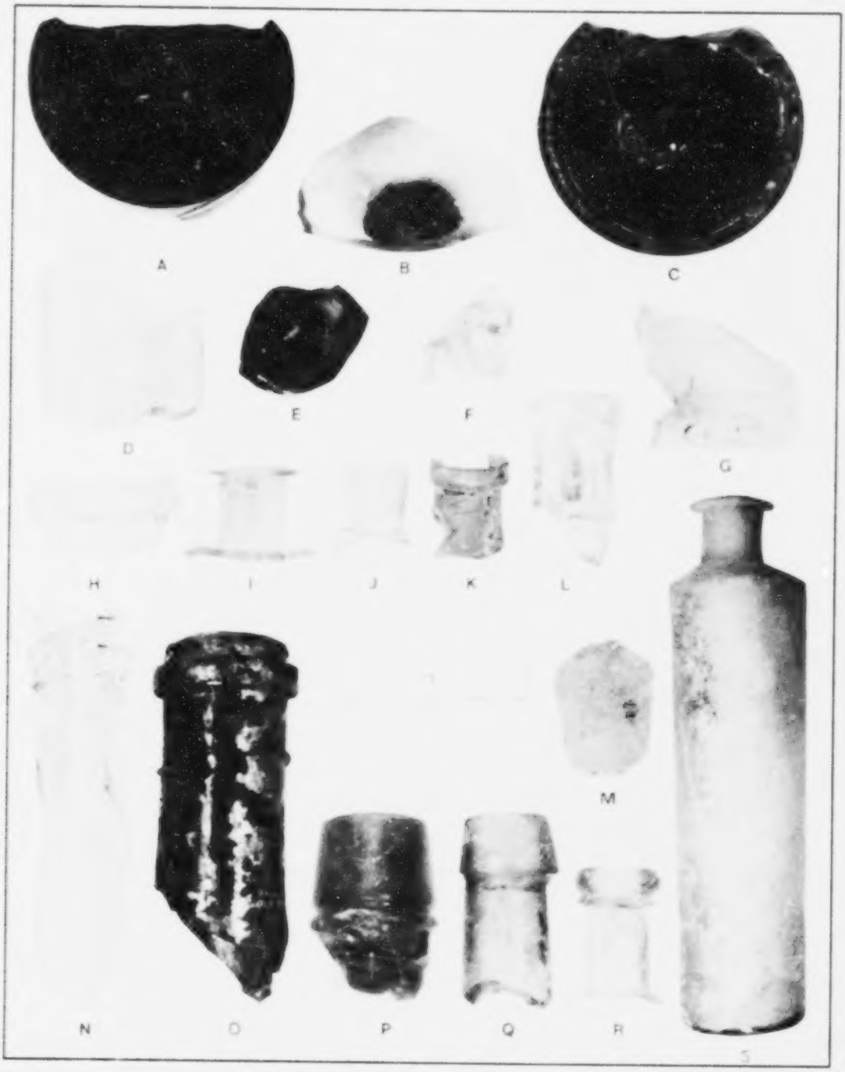
Note: 1326 bottle parts were too small to be formally identified or were melted beyond Recognition. These are excluded.

TABLE 11

Glass Bottle Formation

Pontil Marks	
Glass	21
Iron	9
Blowpipe	10
Sand	13
Fire Polished Mark	7
Snapcase	18
	Subtotal=78
Lip Finish	
Improved Tooled	41
Sheared/Fire Polished	2
Applied Tooled	70
Folded	9
Flanged	11
Flanged/Ground for Stopper	1
Applied String	14
Applied String/Fire Polished	8
Applied String/Sheared	3
	Subtotal=159
Mold Production	
Two-Piece Hinged-Bottom	13
Three-Piece	15
Three-Piece Plate-Bottom	13
One-Piece Dip Bottom	2
Dip-Bottom (General)	4
Use of Mollette	1
	Subtotal=48
	Total=285

Figure 15. Glass Bottles. A) Dark green base with seams from a three-piece plate-bottom mold; B) Aqua base with iron or improved pontil mark; C) Dark green base with sand pontil mark, formed in a dip bottom mold; D) Body of recessed panel, patent medicine/extract bottle; E) Fire polished pontil mark in kickup; F) Scroll design from figural whiskey flask; G) Patent medicine/extract bottle base with blowpipe pontil mark; H) Wide mouth condiment jar with applied tooled, broad-sloping collar lip; I) Flanged lip from medicine vial; J) Plain lip from figural flask; K) Lip from prescription medicine bottle; Thickened lip and ball neck from patent medicine/extract bottle with improved tooled finish; M) Bottle stopper; N) Hand blown wine/champagne bottle with spiral twist and applied string finish; O) Green wine/champagne bottle neck with applied string finish; P) Brown bottle neck with broad-sloping collar over bead and improved tooled finish, probably from a whiskey flask; Q) Applied, broad-sloping collar finish from a bitters/liquor bottle; R) Applied tooled, double bead collar typical of lips from figural flasks; S) Medicine vial with flanged lip produced in a one-piece dip-bottom mold.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Soda Bottle

Six lip/neck sherds are from soda bottles and represent as many vessels. The first has an improved tooled, blob collar finish for the Hutchinson stopper, patented in 1885. The remaining specimens are all early examples of the improved tooled, crown finish, patented in 1892 (Deiss 1981:94). All six sherds are aqua colored and could be associated with cylindrical aqua body and base sherds in the collection. Soda Bottles at Fort Smith postdate the military occupation.

Canning Jar

Canning jars are represented by a single jar rim/body sherd and two fragments of white glass canning jar lid liners. The canning jar rim is from a cylindrical jar with interrupted thread for a screw-on cap. Mason jars with threaded lips were introduced in the early 1860s (Ferraro and Ferraro 1966:52), but the amethyst tinted glass of the Fort Smith specimen suggests a post-1880 manufacture date (Deiss 1981:95).

Two canning jar lid liner fragments are circular, disk-shaped lid inserts. Their surfaces are covered with concentric rings and both specimens are embossed: "---TH F---/MARK O---" and "---Y/---TS." The milk glass liner was invented in 1869 by Lewis R. Boyd (Schroeder 1970:526). The liners from Fort Smith have not been linked to a manufacturer but, if contemporary with the glass canning jar rim, probably postdate the military occupation of the site.

Condiment Jar

Thirteen sherds are attributed to condiment jars. Eight lip sherds from wide mouth containers indicate the presence of at least four jars. Three lips from an aqua colored container exhibit an applied tooled, bead collar. A fourth sherd is from an aqua colored jar with an applied tooled, broad sloping collar finish (Fig. 15H). Four additional condiment jar lips are clear--two of these have flanged lips and two others exhibit improved tooled, bead collars. Five pattern molded body sherds are also from condiment jars. Two aqua colored sherds represent a barrel-shaped mustard jar similar to #319-321 depicted by Wilson (1981:88-89). Three other aqua colored sherds represent a pattern molded gothic or cathedral style pickle jar like #323-326 in Wilson (1981:88, 323). Many of the 480 pattern molded body sherds in the collection could have originated from condiment bottles, but most are too fragmentary for pattern identification.

Bitters/Liquor

Twenty-eight bottle sherds are assigned to a generally defined bitters/liquor bottle. One flat, aqua colored body sherd, embossed "GIN," is functionally specific. It is probably from a case bottle. Twenty seven additional bottle fragments are lips with the broad sloping collar finish (Fig. 15O) that typically occur on case or figural bottles containing schnapps, gin, or bitters (eg. Wilson 1981:17-18, 24-26).

Finish could be determined for 39 lips. Most (31) are applied tooled. Three lips are folded and hand tooled and four others exhibit improved tooled finishes. Bitters/liquor bottles reflect five colors. Most sherds are aqua (24) while brown (8), clear (2), green (6), and dark green (4) occur only infrequently. Many body sherds--830 flat and 480 figural--could be from bitters/liquor bottles but can not be specifically linked to the 45 bottle lips described here.

Whiskey

Whiskey bottles are represented by 165 glass container sherds. Lips and distinctive body sherds indicate at least three varieties of whiskey bottle.

Variety 1 is a simple oval panel, shoo-fly flask identical to specimens illustrated by Wilson (1981:13, 16). One hundred twenty-one sherds from the variety 1 whiskey bottle indicate a minimum of eight vessels. One hundred thirteen neck, body, and base sherds reveal that this bottle always has a short bulbous or "leg" shaped neck. The bottle body is an oval panel flask with flat sides and base. Embossed specimens are rare at Fort Smith since only a single sherd bears the letters "---ED." Four lips are broad collar over bead finishes and four others exhibit a broad sloping collar over bead--although the angle of the collar is acute (Fig. 15P). Variety 1 bottles were produced in both two-piece hinged bottom molds (3) and in three-piece molds (2). Only one base is large enough to determine how the bottle was held during lipping. The absence of a pontil scar suggests the use of a snap case. Seven lips are complete enough to determine the finishing procedure. Four are applied tooled and three are improved tooled lips. Wilson (1981:16) finds this bottle type at Fort Union and places it in the 1865-ca. 1890 time period.

The variety 2 whiskey bottle is a figural flask. Pattern molded body sherds are abundant in the collection--480 have been identified. These are small, however, and only 43 pattern molded sherds can be confidently assigned as whiskey flasks. Based on differences in glass color, a minimum of two such bottles are represented. Forty two sherds are aqua colored and one is green. All exhibit a relief scroll design (Fig. 15F). A typical figural bottle of the second half of the nineteenth century, scroll flasks were manufactured by the Kearns Company, established in 1848, as well as other glass houses (McKearin and McKearin 1948:226). Although figural flasks are not directly associated with lips in the Fort Smith collection, examples depicted by McKearin and McKearin (1948:517-582) consistently display double bead or plain lip finishes. Three double bead bottle lips and four plain lips in the Fort Smith collection could be from figural flasks (Fig. 15J, R). A single base from a figural flask was recovered. It displays two-piece hinge-bottom mold construction and exhibits an iron pontil mark. This "improved" pontil was first used about 1840 (Deiss 1981:92).

A third type of whiskey bottle (variety 3), the whiskey jug, may be represented by a single brown glass handle. Handled jugs were popular from 1840-1870 (Ketchum 1985:85).

Extract

Two bottles once contained extract. One aqua and one clear body sherd are from rectangular, recessed panel bottles. Both are embossed "EXT---" and "EXTRAC-," respectively. Undoubtedly, more extract bottles are present in the collection--but they can not be distinguished from patent medicines. Both were marketed in small rectangular to square bottles, usually with recessed panels. Some have chamfered corners but all patent/extract bottles have a plain, thickened lip (eg. Wilson 1981:111).

Patent/Extract

Because of characteristic lip treatments or body forms, 178 sherds have been classified as a general patent/extract type bottle. The patent/extract bottle as defined by Wilson (1981:111) exhibits a thickened collar, cylindrical neck--often with ball, a rectangular recessed panel body, and flat base. Twenty-one sherds from Fort Smith have a thickened lip (Fig. 15L). Three sherds display a ball neck. Among 156 body/base sherds, 111 are from rectangular bottles with recessed panels--some with chamfered corners (Fig. 15D). Forty-five sherds are from square bottles of the same description. Thirty-one sherds are embossed but are so fragmented, that words could not be defined. Eight colors of patent/extract bottles are evident. Aqua colored bottles are most common (115) with clear (38), amber-to-brown (15), amethyst (6), blue-to-cobalt blue (2), and green (2) occurring in decreasing importance. During the nineteenth century, cobalt blue bottles often signified that poison was contained within (Ketchum 1985:56). Three bottles were produced in a two-piece hinged-bottom mold while two others are clearly manufactured in a three-piece mold. Finishing was accomplished with the snapcase (3) and the blowpipe pontil rod (2). One specimen exhibits a folded tooled lip. Six other lips are applied tooled and the majority are improved tooled (13).

Wine/Champagne

Three hundred twenty sherds are from the lip, neck, and base regions of wine/champagne bottles. A surprising variety of colors occur. Most bottles are green (108), dark green (82), or olive green (10). Aqua colored bottles, however, are prominently represented (88). Brown (21), emerald green (8), and amethytst (3) colored bottles occur less frequently.

Formal variation indicates the presence of two distinct types of wine/champagne bottles. Variety 1 bottles occur mostly in dark green-to-olive green glass and exhibit a broad sloping collar over bead lip, slightly bulbous neck, rounded shoulder, cylindrical body, and a kickup base. The variety 2 bottle, traditional wine/champagne container, is usually green and exhibits a long cylindrical neck, sloping shoulder, kickup base, and string finish (Fig. 15N-O). At least 42 individual wine/champagne bottles are represented--17 are variety 1 bottles and 25 are variety 2 bottles.

Ninety-nine sherds bear some indication of formation. All 42 lips, with one exception that is improved tooled, are applied string or applied tooled finishes. At least four bases were produced in a dip-bottom mold. Most or 14 bases, however, were constructed in a three-piece plate-bottom mold (Fig. 15A). In 1821, H. Rickets and Company obtained the patent for a bottle produced in such a mold. The Rickets' process employed an otherwise two-piece hinged-bottom mold with a removable plate in the base. The plates could be interchanged to produce bottles with embossed company logos (Olsen 1964). Fourteen base sherds exhibit two sets of concentric mold seams that are hallmarks of the Rickets' mold. Only one specimen, however, is embossed ("---C/P---"). Five methods of empontiling are evident among wine/champagne bottles (Fig. 15B-C, E, G). Most marks are from the sand (14) and glass (11) empontiling techniques. Three bases exhibit an improved or iron pontil mark and one other, a blowpipe pontil scar. On seven bases, the pontil mark was obliterated by fire polishing. The procedure left a projecting cone at the top of the kickup (Fig. 15E). Three other bases, without a pontil scar, were finished with a snapcase.

Nearly all wine/champagne bottles in the collection are contemporary with the military occupation of the site. Only the improved tooled lip and three amethyst tinted kick fragments definitely post-date the military presence.

Bottle Stoppers (2)

Two glass bottle stoppers are from unknown containers. The first is represented by the grasp of a brown glass "peg stopper" (eg. Herskovitz 1978:24-25). The grasp is a flat, circular disk. A cork-lined projection or peg once attached to the ventral side of the grasp. The second stopper is represented by the aqua glass peg from a "ground shaft stopper" (eg. Herskovitz 1978:24-25). This stopper accomodated a large bottle (Fig. 15M).

FOOD REMAINS GROUP

The food remains group, an extension of South's (1977) bone group, also contains carbonized plant remains. At Fort Smith, 3,842 bone and carbonized plant remains were recovered from the buried historic ground level.

Floral Remains

Forty-six carbonized plant remains are from eight proveniences (Table MF.11). These include 35 corn kernals and cob fragments (76%), one peach pit (2%), nine walnut shells (20%), and an unidentified seed (2%). Thirty-four charred corn remnants are associated with Feature 21, interpreted as a stable or similar outbuilding. Thus, the corn recovered here may have been used to feed livestock. At least one corn kernal, however, was recovered in apparent association with the fireplace in feature 19, a temporary barracks, and may indicate that this vegetable was consumed by the troops. Likewise, one peach pit was recovered from feature 19. Charred walnut shell was found in three different proveniences, but all in close proximity to hypothesized habitation areas.

Bone Remains

The pedestrian trail excavation produced 3,796 bone elements. A detailed analysis of these remains has been completed by Susan L. Scott and H. Edwin Jackson. Their report is included here as Appendix 2. A detailed listing of all faunal remains may be found in Table MF.12.

ARCHITECTURE GROUP

Architectural objects are numerous at Fort Smith. Building hardware and construction material account for 20,043 artifacts recovered during the investigation (Table MF.13, Table MF.14).

Building Hardware

Key (1)

One wrought iron key has an oval bow, .81x1.0 inch, and a round shank that widens gradually from the bow to the pin or tip of the key (Fig. 16L). The key bit forms a simple square without ward cuts. Overall key length is 2.16 inches.

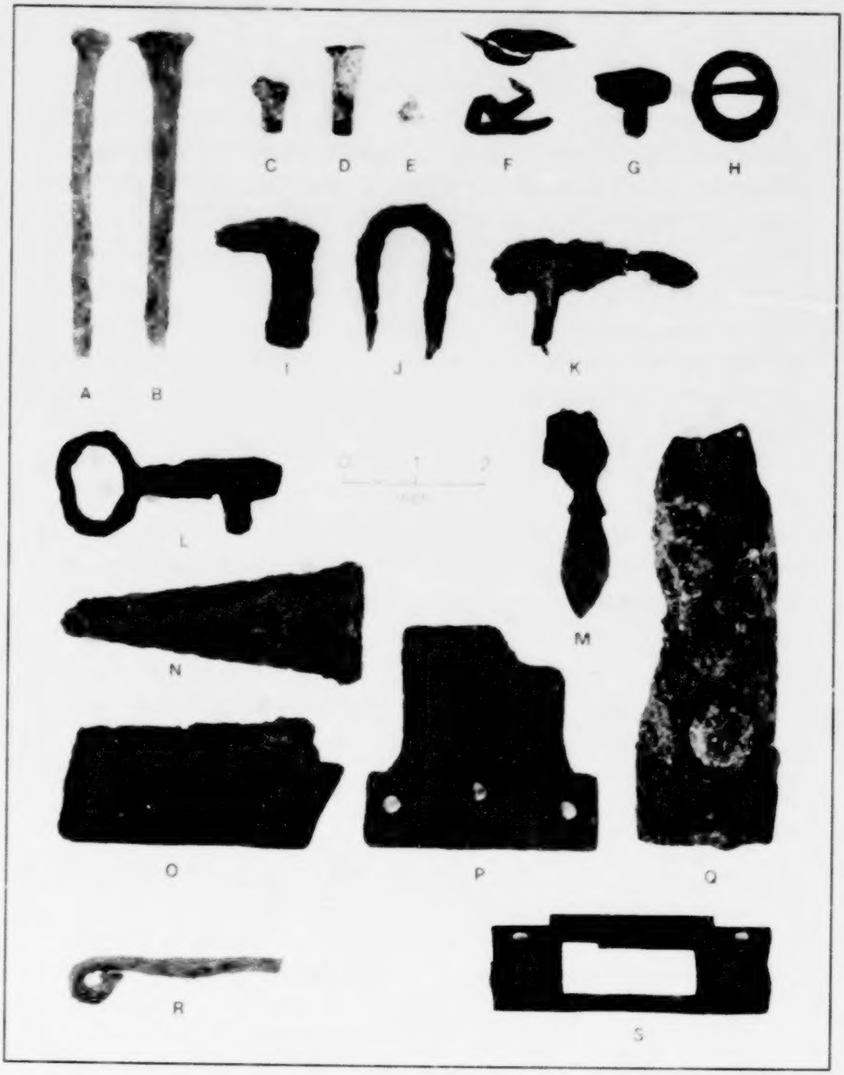
Padlock (2)

Two padlocks are evident in the collection. The first is represented by an ornate, leaf-shaped escutcheon drop (Fig. 16M). The 1.8x.5 inch drop is stamped from .65-inch thick sheet brass. Iron oxide adhering to the ventral side of the escutcheon drop indicates an iron padlock with brass fittings. The second example is an iron padlock fragment with an oval, brass keyhole escutcheon, .88x.68 inch, and a leaf-shaped brass escutcheon drop that measures 1.0x.43 inch. Both padlocks are similar in appearance to "wrought iron locks with brass drops" marketed in 1865 by the Russel and Erwin Manufacturing Company (APT 1980:106-107). About 1854-1855, the Fort Smith quartermaster requisitioned 36 padlocks to be used at Fort Smith and its dependent posts (Bento 1988:115).

Door Lock (2)

Two artifacts are door lock components. A rectangular shaped cast iron plate is the front of a door "plate lock" (APT 1980:140). The plate is .012-inch thick and measures 1.9 inch wide by 3.12 inches long. A keyhole is present in the lower center of the plate as is one rivet hole. The second artifact is a wrought iron lever and spring from a lever tumbler lock (Alth 1972:45). The object is .45 inch wide, 2.3 inches long, and .2 inch thick. Many different types of door locks, all employing tumblers or levers, were requisitioned by the quartermaster. In 1854 or 1855, 24 "plate locks" were ordered by the quartermaster for use at Fort Smith and its dependencies (Bento 1988:115).

Figure 16. Architecture Group Artifacts. A) Boat Spike; B) Hand Forged Spike; C) Cast brass nail; D) Flat tipped woodscrew; E) Zinc glazier's point; F) Sheet brass clippings; G) Construction Rivet; H) Doorknob bushing for rabbetted mortice latch; I) Railroad spike; J) Construction staple; K) 9d nail in sheet iron; L) Key; M) Padlock escutcheon drop; N) Triangular strap hinge; O) Butt hinge; P) Parliament butt hinge; Q) Lead suction pipe; R) Strap hinge for pintle; S) Brass striker plate.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Striker Plate (1)

One cast brass striker plate for a door lock was recovered (Fig. 16S). The striker plate fastened to the door jamb to engage a door lock strike. The rabbeted striker plate is 3.95 inches long and 1.36 inch wide. Two countersunk screw holes, .23 inch in diameter, are placed at opposite ends of the striker plate for attachment to the jamb.

Butt Hinge (4)

One complete and three partial butt hinges are represented (Fig. 16O). The only complete butt hinge in the sample is a wrought iron, fast-joint butt. Each flap measures 2.4 inches wide and 1.0 inch long and is perforated by three screw holes. One hole contains a nail or screw fragment. The remaining incomplete hinges are from a cast iron butt hinge. Portions of the left and right flaps are present and indicate a .215-inch thick hinge with 1.37-inch long flaps. It is a fast-joint hinge that employs a pivot/dimple principle instead of a hinge pin. Each knuckle on the butt flap has a pivot that fits into a depression on the opposing knuckle. Three countersunk, .25-inch diameter screw holes are present on each flap.

Parliament Butt Hinge (1)

One half of an H-shaped, cast iron hinge is present (Fig. 16P). Called a "Parliament Butt" in a period catalogue (APT 1980:116), the hinge is a loose-joint variety. "The loose joint hinge, made with heavy flaps and knuckles, is rapidly replacing the fast joint hinge," proclaimed the Russel and Erwin Company in 1865 (APT 1980:116). The extant flap is 3.17 inches long, 3.35 inches wide on the edge of the flap, and 2.32 inches wide at the joint. The .267-inch thick hinge flap contains three .25-inch diameter screw holes placed along the flap edge. Identical but smaller specimens were found by Walker (1971:83) at the Arkansas

State Bank at Arkansas Post.

Triangular Strap Hinge (5)

Triangular strap hinges (Fig. 16N) in the collection are all manufactured of wrought iron. The only complete specimen is a fast-joint hinge, 1.25 inch wide at the knuckle. Each adjoining strap is 4.3 inches long and contains four .25-inch diameter screw holes. The hinge is constructed of .083-inch thick sheet iron. A second hinge, represented by a right flap, is 4.25 inches long and 1.83 inches wide at the joint. Four .25-inch diameter screw holes are present. Three other specimens are too fragmentary for measurement but each is .1 inch thick with one or more .25-inch diameter screw holes.

Unidentified Hinge (6)

Six hinges are too fragmentary to be identified. All are from relatively large cast iron hinges, however, and exhibit thicknesses ranging from .2-.25 inch. Three examples display knuckles of the fast-joint type. Two specimens have .3-inch diameter, countersunk screw holes. One example has a .25-inch diameter, 1.57-inch long screw in place.

Strap Hinge (1)

One hand forged, iron strap hinge for a pintle is represented (Fig. 16R). The object is fashioned from .315-inch diameter rod flattened at both ends. One end is bent to form a .38-inch diameter eye to engage a pintle. The distal end of the hinge is broken and overall length is undetermined.

Doorknob Bushing (1)

One flanged, brass bushing with iron cotter (Fig. 16H) is probably for a "rabbeted mortise latch" similar to that depicted in the 1865 Russel and Erwin catalogue (APT 1980:51). The .38-inch high, .635-inch diameter bushing would have been fastened to a doorknob spindle by means of a pin inserted through holes in the bushing and the spindle. A .92-inch wide flange on the bushing would have engaged a rabetted mortise latch upon turning the doorknob.

Suction Pipe (1)

One fragment of cast lead (Fig. 16Q) probably represents a suction pipe for hydrants, wells, or cisterns (APT 1980:283, 288). The partial, four-inch long section of pipe exhibits a bore diameter of 1.25 inch and a round .682-inch diameter protrusion on the pipe exterior. The pipe wall is .27 inch thick. The Russel and Erwin Manufacturing Company marketed similar pipe in cast iron and lead. These also have short protrusions on each pipe section, apparently to assist in positioning and turning pipe. Suction pipe was sold in one or two foot lengths and in six different bore diameters including 1 1/4 inch.

Screw Eyes (3)

Screw eyes are threaded screws with an eye or loop at the head. The Russel and Erwin hardware catalogue of 1865 illustrates "wrought iron screw eyes" identical to specimens from Fort Smith (APT 1980:154). Three iron screw eyes recovered all reflect different dimensions ranging from 1.33 inch to 1.88 inch in length and eyes are from .22-.6 inch in diameter. Only one specimen is intact enough to determine that it has a gimlet-pointed tip.

Wood Screws (7)

Seven wood screws from the sample are all slotted, flat-head iron screws. Three screw sizes are evident: one inch, one and one-half inch, and two inch. Head diameters are variable and range from .37 inch to .53 inch. All examples are highly corroded but tips are evident on four specimens. Two are machine made, gimlet pointed screws and two other examples are flat tipped, hand made screws (Fig. 16D).

Construction Material

Sheet Brass Clippings (150)

Sheet brass fragments from Fort Smith are small, angular clippings from the construction of gutters and downspouts, and from flashing (Fig. 16F, Table MF.15). Similar objects occur at Fort Washita (Lewis et al. 1975:117), and in 1850, Fort Towson had 13 pounds of sheet brass in stock at the post (Bento 1988:114). The Fort Smith excavation produced 150 sheet brass clippings. Fifty-three or 79% of all clippings exhibit evidence of snipping or cutting from the construction process. Five of the thickest specimens are unmistakably chisel cut. Six clippings are crimped or folded and probably reflect joining or seaming two sections of sheet brass. Three specimens are perforated.

Eleven gauges or thicknesses of sheet brass are evident. Two sizes account for most of the clippings: .5 mm thick (39%) and .65 mm thick (45%). All other sizes combined comprise only 16% of the sample. Seventy-eight percent of all clippings were recovered during the pedestrian trail mitigation in squares that also produced quantities of blacksmithing debris. An association with the post smithy may be implied.

Sheet Zinc (48)

The Fort Smith excavation produced 48 fragments of sheet zinc (Table MF.15). These range in thickness from .75-2.0 mm thick. Modal thickness is .75 mm. Two specimens exhibit a folded seam. Sheet zinc was used for construction at military posts. In 1850, Fort Towson had 105 sheets of the metal on hand

(Bento 1988:114). At Fort Bowie, Herskovitz (1978:95) infers that soldiers used sheet zinc as a roofing material.

9d Nail in Sheet Iron (1)

One nine penney square-cut nail, hammered through a fragment of sheet iron, was recovered (Fig. 16K, Table MF.14). On November 4, 1859, the Fort Smith quartermaster requisitioned 200 pounds of sheet iron for use at Fort Smith and its dependencies (Bento 1988:114). As the 9d nail may suggest, the metal was intended by the army for construction--possibly for roofing, gutters, or flashing. Other sheet iron fragments may be present in the collection. Because of their small size or lack of identifying hallmarks, these could not be separated from tin containers.

Window Pane (4,692)

The excavation produced 4,692 sheet glass fragments from window panes (Table MF.16). Because of the small size of the fragments, pane dimensions could not be reconstructed. Glass thickness and color, however, were recorded (Table 12). Most of the recovered sheet glass is aqua colored and only 181 pieces--less than four percent of the sample--can be classified as clear glass. Clear colored window pane in the collection probably reflects normal variation in the sample. Distinctive patterns on either thickness or provenience are not apparent. Glass in the collection ranges from .8-3.5 mm thick and exhibits a distinctive trimodality with higher frequencies of glass within the 1.3, 1.7, and 2.0 mm size classes. Window pane becomes progressively thicker through time. Thus, the three modes in thickness may reflect distinct building or repair episodes.

TABLE 12

Window Pane by Thickness and Color

Thickness	Aqua	Clear	Total
0.8	2		2
0.9	4		4
1.0	50	1	51
1.1	143	2	145
1.2	197	8	205
1.3	326	9	335
1.4	314	13	327
1.5	421	34	455
1.6	492	18	510
1.7	531	27	558
1.8	440	19	459
1.9	278	4	282
2.0	349	14	363
2.1	198	5	203
2.2	180	9	189
2.3	178	5	183
2.4	121	3	124
2.5	96	3	99
2.6	78		78
2.7	47	3	50
2.8	36		36
2.9	17	1	18
3.0	9	3	12
3.3	3		3
3.5	1		1
Total	4511	181	4692

Glazier's Point (1)

A single glazier's push-point recovered at Fort Smith (Fig. 16E, Table MF.14) is an isosocles triangle, .35 inch to a side, stamped from .04-inch thick sheet zinc. In 1865, "glazier's points" of tin or zinc were sold by 1/2 pound papers (APT 1980:255). Glazier's points were regularly requisitioned by the Fort Smith quartermaster (Bento 1988:115) and can be expected to occur in an archeological context. Because of their small size, however, glazier's points are rarely recovered.

Brick (16)

Bricks are abundant at Fort Smith where they were locally produced. Dollar's (1966:I 16-22) excavation documented quantities of brick in apparent association with the first Fort Smith. It is not clear whether brick was introduced during the initial fort construction in 1817-1820 or through later documented repair episodes, the last in October, 1838 (Haskett 1966:227). The recovery of one brick from feature 77 (Appendix 1), an outbuilding believed to be associated with the 1817-1824 occupation of the post, suggests that brick was produced and incorporated during the early stages of construction.

The first recorded manufacture of brick at Fort Smith was in the fall of 1838, when Major Charles Thomas established a brickyard on the military reservation. Some 50,000 bricks were molded before the end of the year but because of wood shortages, were not kilned until May, 1839 (Thomas 1972). Several other kilns were burned in the following Months. From June to November, 1839, soldiers fired 250,000 bricks. In 1841, as construction progressed, an additional 220,000 bricks were kilned (Bearss 1963:108,118). Apparently, brick production ended before the post was formally garrisoned in 1846. Scarcely three years later, however, the new soldier's barracks burned to the ground. Reconstruction of the building from 1849-1851, required the contractor to produce the necessary bricks.

Bricks are predictably numerous at Fort Smith. In fact, this ubiquitous artifact was selectively collected--only measurable specimens were retained for analysis. Sixteen measurable bricks were recovered from the buried historic ground level (Table MF.17). In appearance, these are soft pasted, orange colored brick with numerous ferrous concretions such as occur in Muskogee Silt Loam soils. As a result, these brick were probably manufactured locally during the documented periods of brick production from 1839-1851. A single complete brick provides a length (distance from head to head) of 8.3 inches. Brick width (distance from stretcher to stretcher) ranges from 4.1-4.41 inches. Thickness, measured from face to face, ranges from 2.02-2.67 inches. Thus, brick size fluctuates from 4-6 tenths of an inch on at least two dimensions. Based on available measurements, the average sized brick is 8.3 inches long, 4.25 inches wide, and 2.27 inches thick.

Nine bricks in the sample exhibit indications of use. The orange mortar typical of military construction at the post adheres to eight bricks. One brick exhibits whitewash and two others are burned. Eight bricks were incorporated in stretcher courses with sides exposed. One other example was used in as unusual exposed face position such as a sailer or shiner course would produce (eg. Hill 1986). The whitewashed specimen may indicate exposure within a building interior and both burned bricks are probably from the intertior of a brick chimney shaft. All of the bricks in the sample could have been incorporated into fireplaces.

Slate Shingle (2,353)

The pedestrian trail excavation produced 2,353 pieces of slate roofing shingles from 125 proveniences (Table MF.18). Slate shingles were extensively employed during the early construction history of the second Fort Smith. By 1846, the stately officer's quarters and soldier's barracks were finished with slate roofs. At one time, the commissary building is believed to have supported a slate roof. Not surprisingly, slate is abundantly represented in all post-construction contexts of the second Fort Smith.

Construction Spikes (10)

Hand Forged Spike. Two hand forged iron spikes occur in the sample (Fig. 16B, Table MF.14). These exhibit irregular oval heads and square shanks that, beginning three inches below the head, are fullered to a round point. Head diameters range from .8 to .45 inch and shanks range from .38 to .45 inch thick. One complete specimen exhibits a length of 4.6 inches.

Railroad Spike

One typical railroad spike has an oval-shaped head, 1.45x1.17 inches, and a square .62-inch thick shank (Fig. 16I, Table MF.14). The specimen is broken and length is unknown. This spike probably originated from the adjacent railroad--originally the St. Louis and San Francisco line, constructed sometime around 1886-1889 (Table 3).

Boat Spike

Seven boat spikes are represented that exhibit a five-faceted, reinforced square head, and a uniform shank with chisel-like tip (Fig. 16A, Table MF.14). Head diameter ranges from .55 inch to .7 inch; length ranges from 4.75 inch to 7.0 inch; and shank thickness is always .35 inch thick. This suggests that boat spikes were formed from a standard sized bar stock. The chisel point tip and faceted heads were probably hand forged. In 1865, the Russel and Erwin Hardware Company advertised wrought boat spikes from 2-12 inches long (APT 1980:253). Thirty years later the Montgomery Ward (1895) catalogue did not list iron spikes at all. Walker (1971:88) suggests that hand wrought spikes may date ca. 1860-1880, and that in the following decade, were replaced by large pennyweight nails.

Construction Staples (9)

Nine hand wrought construction staples were recovered during the investigation (Fig. 16J, Table MF.14). All are produced from round iron stock bent into a U-shape. Both prongs were then fullered to flat chisel-like points. The staples vary in size, as is chatacteristic of a hand forged product, and range from .5-1.1 inches in interior width and from 1.8-4.27 inches in length. The average staple is .72 inch wide and 2.57 inches long. The staples could have been employed during any aspect of building or fence construction. One specimen is clenched and may have functioned as a latch-hook eye. Identical construction staples have been encountered at other contemporary military posts including Fort Griffin (Olds 1969:38), Fort Richardson (Westbury 1977:70, 78-79), and at Fort Washita (Lewis et al. 1975:116-117, 253).

Rivets (4)

Four iron rivets were recovered that may have been used in construction at the post (Fig 16G, Table MF.14). All four rivets display round heads with diameters ranging from .55-1.0 inch. Only one unused rivet reveals an absolute length of 2.33 inches. Two rivets have been chisel cut, and the fourth has a burred distal end, indicating that it clenched a 1.25-inch thick surface.

Masonry Tie (1)

A masonry tie is a long iron rivet with sheet iron plate (rove) used to keep brick or stone and wooden joists from separating (Table MF.14). The specimen recovered at Fort Smith is a large .35-inch diameter rivet with a flat, irregular head approximately .75 inch in diameter. The opposite end of the rivet is burred to hold a diamond-shaped iron rove, 1.31 inch to a side. The length or span of the tie is 3.85 inches. An identical specimen from the first Hermitage is called a "carpenter's rivet" by Smith et al. (1976:217) and is believed by him to have fastened wrought iron hinges. Mortar adhering to the Fort Smith specimen, however, confirms the function as a masonry tie.

Nails (12,771)

Nails, the most numerous architecture group artifact, accounts for 12,771 objects (Table MF.19). Nails in the collection are highly corroded and difficult to identify. Only 8,719 specimens are identifiable to form and only 3,062 nails can be measured and assigned a pennyweight. Nonetheless, the sample is adequate for comparative purposes. Table 13 summarizes nails by type and size.

Nails are useful tools for dating and structural analysis. Prior to about 1790, when specialized nail cutting machinery was introduced, all nails were made by hand. By 1800, square cut nails had largely replaced the hand forged product. Because cut nails were too brittle to clench, hand forged nails continued to be used for special purposes (Mercer 1976:247). At first, heads on cut nails were formed by hand. About 1815, innovations in the cutting machinery resulted in a completely machine made product. By 1830, the fiber of the metal ran lengthwise, making it possible to clench square cut nails. By the mid-nineteenth century, a round, drawn wire nail was developed in Europe. In the United States, this new nail did not compete successfully with square nails until the last quarter of the nineteenth century (Noel Hume 1980:253-254).

Length is an excellent indicator of nail function. Walker (1971:72) summarizes the typical uses to which nails of specific pennyweights were usually employed: tin roofing, flashing, and plastering (2d-3d nails); wooden shingles, moulding, and interior finishing (4d-5d nails); light framing, clapboarding, bevel siding, and wood grounds (6d nails); flooring, furring strips, wood grounds, and interior fittings (8d-10d nails); studding (12d nails); studding, rafters, and heavy framing (16d nails); and for heavy framing (20d-60d nails). The tasks for which the military used nails is, expectedly, more rigidly defined. The 1860 regulations concerning barracks and quarters for the United States Army provides these guidelines for estimating construction needs: lathing walls and ceilings (3d nails); shingling (6d nails); furring (8d nails); flooring, framing windows and doors, weather boarding, wainscotting, wash board, stairs, sheathing, and pillars and roof of veranda (10d nails); framing joists and roofs, planking walls, flooring stalls and stables, and sheathing (20d nails) (Crouch 1978:110).

TABLE 13

Nails by Type and Pennyweight

Length (in.)	Penny-Weight	Forged	Square	Wire	Unknown	Total
1.00	2d	1	31			32
1.25	3d	1	175			176
1.50	4d	1	188			189
1.75	5d	5	191	2		198
2.00	6d	5	429			434
2.25	7d	2	139			141
2.50	8d	3	466			469
2.75	9d	1	162	1		164
3.00	10d	1	395			396
3.25	12d		247			247
3.50	16d		379	1		380
4.00	20d		53			53
4.50	30d	1	114	1		116
5.00	40d		15			15
50	50d		26			26
0	60d		26			26
wn	Unknown	66	5591		4011	9668
To		87	8627	5	4011	12730

Cast Nail

Cast nails were used from the 1770s to the 1820s and preceded the development of machine cut nails (Spivey et al. 1977:151). A single cast nail of cuprous metal was recovered at Fort Smith (Fig 16C). It is a medium size nail represented by an oval head and square shank (Table MF.14) Overall length can not be determined.

Forged Nails

Eighty-seven forged nails are evident. These display multi-faceted heads and chisel pointed tips. Twenty-one intact specimens range in size, as is characteristic of a hand made product, from 1.1-4.7 inches. For comparative purposes, forged nail lengths in table 13 have been rounded to the closest standard pennyweight length. In all likelihood, the forged nails represent a pre-1830 association. Forged nails are of lengths associated with shingling, furring and flooring. With one exception, lengths suited to framing were not recovered. Forged nails excavated during this project were probably affiliated with log structures.

Square Cut Nails

Only 3,036 square cut nails are measureable. These exhibit square heads, flat tips, and grain paralleling the shank--attributes of nails produced after 1830. Pennywights from 2d-60d are all well represented and probably indicate the presence of frame structures.

Wire Nails

Only five wire drawn nails are present (Table 13). These nails were probably deposited during the late civilian occupation of the site. Wire nails were not produced in the United States until 1876 (Lewis 1972:63). Because of their small number, wire nails at Fort Smith probably reflect repair of military structures and not new construction on the site.

FURNITURE GROUP ARTIFACTS

As defined by South, furniture group artifacts include only furniture hardwares. The definition is here expanded to include other domestic furnishings including lighting and heating devices, clocks, wall mirrors, and nonculinary ceramic vessels and fixtures. The excavation produced 134 artifacts from the furniture group.

Mirror Glass (86)

Eighty-six sheet glass fragments have spots of discolored silvering adhering to one surface (Table MF.20). Mirror glass sherds range from 1.0-2.9 mm thick and are predominantly aqua colored although two of the thickest sherds are clear. Three clusters or modes in glass thickness are apparent and probably represent a minimum of three mirrors. The first is an aqua glass mirror with a modal thickness of 1.2 mm. Although the specimens are small, one sherd with a corner and two sherds with straight edges indicate a square or rectangular mirror. A second aqua glass mirror displays a modal thickness of 2.3 mm and a third mirror of clear glass is the thickest (2.9 mm) of all three.

Stoves/Ranges (29)

By 1820, boxstoves for heating had become popular in the United States. After the Civil War, coal burning ranges with removable lids eventually surpassed the open fireplace for cooking (Walker 1971:246). By the end of the nineteenth century, a remarkable diversity of ornate stoves and ranges were available to consumers (eg. Floyd, Wells & Co. 1988:8). Fort Smith and its dependencies were using "woodstoves" as early as 1850, since a September 30, post inventory notes their presence at Fort Towson (Bento 1988:110). Archeological evidence establishes the use of stoves/ranges at both Fort Towson and Fort Washita (Lewis et al. 1975:130-132, 193). Stove or range parts are also present at Fort Smith.

Twenty-nine cast iron fragments from stoves and ranges were recovered from the pedestrian trail excavation (Table MF.22). Stove fragments were defined on the basis of unusual structural attributes after Spivey et al. (1977:246). Complex or eccentric shapes are not typical of cast iron cooking utensils. Two cast iron fragments represent removable stove burner plates. These are flat, circular plates with flanged edges for seating into burner holes

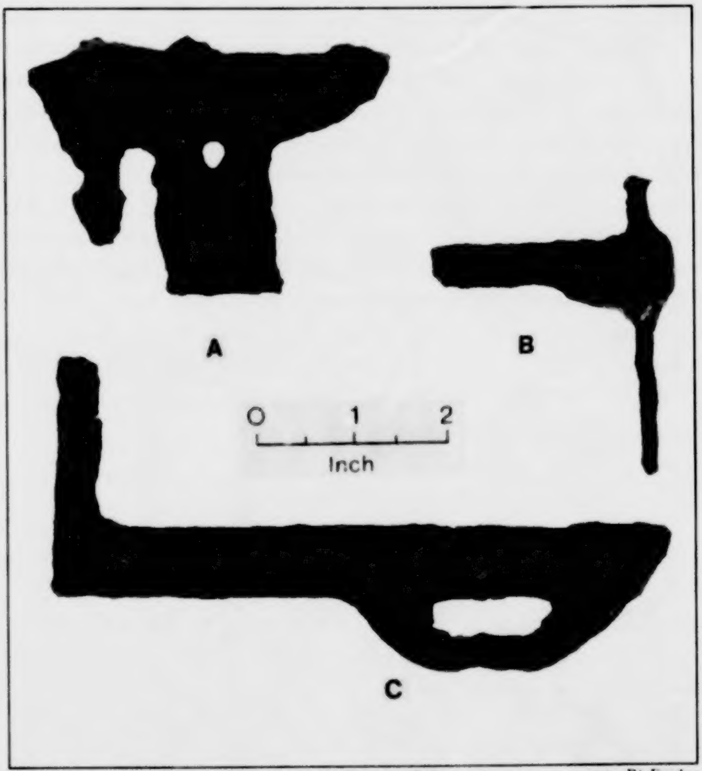


FIGURE 17. Selected stove/range parts. A) Unidentified stove/range component; B) Feeder door hinge and hinge pin. C) Stove door handle.

of the stove top. Two additional objects are stove feeder-door hinges. Both are perforated cast iron tabs from a swing-type door. One contains a .315-inch diameter hinge pin (Fig. 17B). One complex cast iron object is a U-shaped handle with a rectangular cross-section, that may have opened a stove door (Fig. 17C). Two articles represent cast iron grate bars from the bottom grate of a stove. Fuel was stacked on grate bars allowing the free circulation of oxygen in the fire reservoir. Both grate bars have a triangular cross-section. The remaining 22 cast iron fragments are from the body or fire reservoir of stoves and ranges. These exhibit various molded designs that, because of the fragmentary condition of the recovered specimens, could not be identified. Likewise, none of the stoves could be identified by manufacturer.

Mirror/Picture Frame (1)

The excavation produced one section of a stamped sheet brass mirror/picture frame with molded repousse' floral design (Figure 18H, Table MF.21). Dimensions of the recovered section are .37 inch wide and 1.25 inch long. Although overall measurements may not be ascertained, a small oval-to-round frame is evident. A projection or tab on the frame interior held glass or mirror within the frame. Remnants of black pigment on the frame surface indicate a Japanned finish.

Furniture Hardware (19)

Nineteen artifacts are furniture hardware (Table MF.21). These include drawer pulls, drawer catch, cabinet door hinges and screws, carpet and upholstery tacks, and a coffin tack. Although coffin hardware would not normally be included in furniture group artifacts, this specimen was found in a domestic context and may have been used as a drawer pull.

Drawer Pulls

Two drawer pulls were recovered. The first is a cast brass knob with threaded shank and a round head, .41 inch diameter and .5 inch long (Fig. 18K). Overall length of head and shank is .8 inch. A second drawer pull is a cast iron knob with a threaded shank and spool-shaped head, .5 inch diameter and .55 inch long. Overall length of this knob, including head and shank, is 1.3 inch.

Drawer Catch

A drawer catch is stamped from heavy gauge sheet brass (Fig. 18K). The catch is pear shaped, .785x.55 inch, and exhibits a .175-inch diameter perforation for a spindle. The device is designed to rotate on a latch turned spindle and slide into a receiving groove to lock a drawer or cabinet door.

Brass Butts

Two brass butt hinges in the sample are incomplete. Both, however, are small hinges typical of those used on furniture during the nineteenth century (Walker 1971:91). The first hinge is stamped from .082-inch thick sheet brass and is 1.0 inch wide. The second hinge is stamped from .05-inch thick sheet brass. Two countersunk screw holes for .185-inch diameter screws are evident.

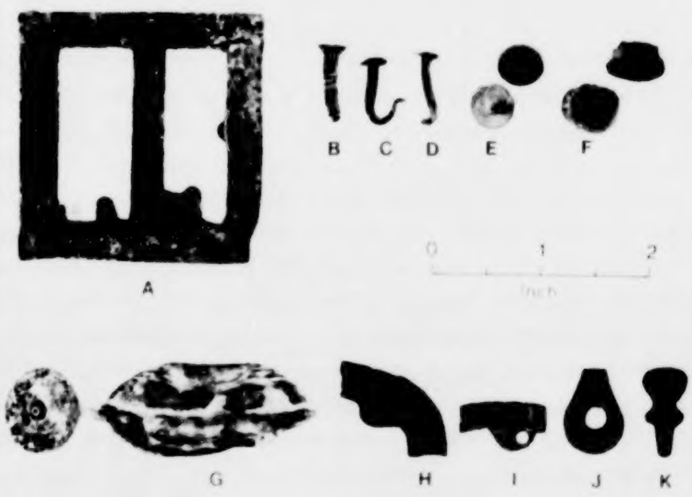


FIGURE 18. Selected Furnishings. A) Clock movement plate; B) Brass screw; C-D) Carpet tacks; E) Upholstery nails; F) Coffin tack; G) Kerosene lamp burner; H) picture/mirror frame; I) Clock movement gear; J) Drawer catch; K) Drawer pull.

Screw

One brass screw is a small specimen typical of those used on domestic furnishing hinges of the nineteenth century (Walker 1971:91). In excellent condition, the specimen is a flat head, gimlet pointed screw with a head diameter of .27 inch and a length of .7 inch (Fig. 18B).

Carpet Tacks

Four copper tacks, identified in the Montgomery Ward catalogue (1895:344) as "coppered carpet tacks" were recovered (Fig. 18C-D). Personal observation reveals that such tacks are also used to upholster period furniture. All four specimens, cut from copper plate, exhibit square shanks that taper to points, and round .25-inch diameter heads. At least two sizes are evident--a 3/4 inch tack and a 1 inch tack.

Upholstery Nails

Eight oval-headed tacks were recovered from the excavation (Fig. 18E). The Bloomingdale catalogue of (1886:86), depicts identical specimens called "brass headed upholstery nails" while the 1895 Montgomery Ward catalogue (1895:351) refers to other identical specimens as "gilt furniture nails." The latter company marketed two sizes of upholstery nails. The Fort Smith specimens are oval, convex headed tacks with square shanks welded to the head. All shanks, however, are broken at the head and are unmeasurable. Head diameters range from .325-.419 inch and indicate a great deal of variation in tack size. Mean head diameter among all specimens is .371 inch.

Coffin Tack

One white-metal coffin tack is of composite construction (Fig. 18F). The tack exhibits an iron shank set into a cast pewter head. Diameter of the thimble-shaped head is .55 inch. Knurled or textured bands encircle the top and bottom of the tack head. The shank, unmeasurable, has been clinched to mount the tack to a wooden surface. The Fort Smith specimen is identical to #14 in the

the tack to a wooden surface. The Fort Smith specimen is identical to #14 in the Russel and Erwin Hardware Company catalogue of 1865 that they classify as a "double filagree fine white metal coffin tack" (APT 1980:331). Although the tack is obviously coffin hardware, its presence near feature 19 suggests use as a domestic furnishing such as a drawer pull.

Lighting Devices (11)

The excavation produced 11 artifacts from lighting devices. These include a kerosene lamp burner and 10 glass lamp chimney fragments.

Kerosene Lamp Burner

The collection includes a single lamp wick mechanism or "burner" (Montgomery Ward 1895:554). Although misshapen and unmeasurable, it is evident that this burner fits a circular reservoir, has a toothed control wheel, and slot for a flat wick (Fig. 18G, Table MF.21). This form of burner--for kerosene lamps--made its advent in the early 1860s (Bingham 1972:44). Historic quartermaster shipping and receiving lists indicate that in 1850, two "lanterns" were in stock at Fort Towson and that in ca. 1854, six "globe lanterns" were requisitioned by the Fort Smith depot (Bento 1988:110). These, however, were probably powered by oil or candle. Because of the volatility of the fuel, kerosene lamps were not officially permitted by the Quartermaster Department until after 1879, and only then on a trial basis (Risch 1962:489). The presence of a kerosene lamp at Fort Smith may indicate that this regulation was not closely followed. A similar burner has been recovered elsewhere at Fort Smith in an unmistakable military context. In fact, kerosene lamps have been identified at several posts including Fort McKavett (Black et al. 1980:205, 239), Fort Sill (Spivey et al. 1977:92), Fort Richardson (Westbury 1977:69), and Fort Bowie (Herskovitz 1978:72-73).

Glass Lamp Chimney

Ten glass sherds are from lamp chimneys (Table MF.10). All are free blown, clear glass chimneys without mold seams. One example has a ground rim. Seven other sherds with intact rims are fire polished. The recovered specimens are small and little may be said of chimney shape. Sherds from neck regions are cylindrical. Free blown lamp chimneys were manufactured until ca. 1898 (Deiss 1981:92).

Clocks (2)

The presence of clocks at Fort Smith is established by the recovery of a clock movement gear and gear plate (Table MF.21).

Movement Gear

One heavy toothed gear--too fragmentary to measure--is probably a clock movement gear. Cast from brass, the circular gear displays at least one offset pinion or pivot hole (Fig. 18I).

Gear Plate

A gear plate from a small, square clock occurs in the collection (Fig 18A). Stamped from .05-inch thick sheet brass, the plate forms a hollow square with centerbar. Exterior dimensions are 2.235x2.235 inches. The plate contains 13 rivet and pivot holes ranging from .04-.155 inch diameter. One large hole on the movement plate border contains a .415-inch long, copper clinch rivet. Presumably, the remaining six holes of equal diameter contained clinch rivets to fasten movement plates together. Smaller diameter holes may have harbored pivots of individual pinions or balance wheels suspended between the gear plates. A similar specimen is depicted by Wolf (1983:40) that comes from an 8-day pendulum clock.

Ceramic Furnishings (9)

Ewer

A single white pasted, clear glazed, earthenware rimsherd is from an ewer or large pitcher (Table MF.23). Such vessels are typically used to supply water for the wash basin. Molded ribbing, a design that first appeared as a registered style in 1863, occupies the exterior border of the container (Fig. 13G).

Chamber Pot

Four ceramic sherds that represent a minimum of three vessels are identifiable as chamber pots (Table MF.23). All are white pasted earthenware vessels with broad, flat, extruding rims. Three sherds are clear glazed and the fourth exhibits a pearl glaze. Only one sherd is decorated and it exhibits a molded border design of undetermined pattern.

Slop Jar

Four white pasted, clear glazed, earthenware sherds from a single vessel represent a slop jar (Fig. 12A, Table MF.23). These rim and body sherds are from a large, cylindrical container with wide orifice and applique handles. A blue, abstract transfer printed design adorns the exterior border and handles of the vessel while a blue/light blue floral pattern occupies the exterior center field. Slop jars are used to remove the contents of the wash basin and chamber pot.

ARMS GROUP ARTIFACTS

The excavation produced 231 artifacts from both martial and civilian weapons. These include gun furniture and accessories, metallic cartridges, percussion caps, lead projectiles and casting debris, and canister shot.

Gun Furniture and Accessories

The Fort Smith collection contains 13 gun parts from a variety of weapons. These include a mainspring, butt plate, heel plate, nosecap, ramrod ferrules, flashpan, revolver frame, nipple protector chain, trigger, tumbler screw, and rifle sling swivel (Table MF.24).

Mainspring (1)

A mainspring, from an unknown weapon, was recovered during the investigation. The iron spring is 3.25 inches long and .73 inch wide at the widest point (Fig. 19AA).

Butt Plate (1)

One fragment of .05-inch thick sheet brass is from a butt plate. Only a small portion of the cheek and shoulder sides of the plate are present. Dimensions of the partial butt plate are 1.9 inches long and .9 inch wide.

Heel Plate (1)

A heel plate, stamped from .07-inch thick sheet brass is represented. The specimen is fragmentary with a width of .75 inch and a partial length of 1.8 inches. Both ends of the heel plate are snapped at screw holes. These are spaced 1.45 inches apart and are countersunk for a .206-inch diameter screw.

Nosecap (1)

One pistol or rifle nosecap was recovered during the investigation (Fig. 19CC). Stamped from sheet brass, the nosecap exhibits a recess for an octagonal barrel and a ramrod indentation on the reverse side. Two screws in the ramrod indentation once attached the nosecap to the gunstock. The barrel recess would have held a barrel .98 inch from land-to-land. The nosecap is 1.52 inches long and is 1.1 inches wide. Similar nosecaps were popular on civilian weapons of the period but were not employed on martial arms.

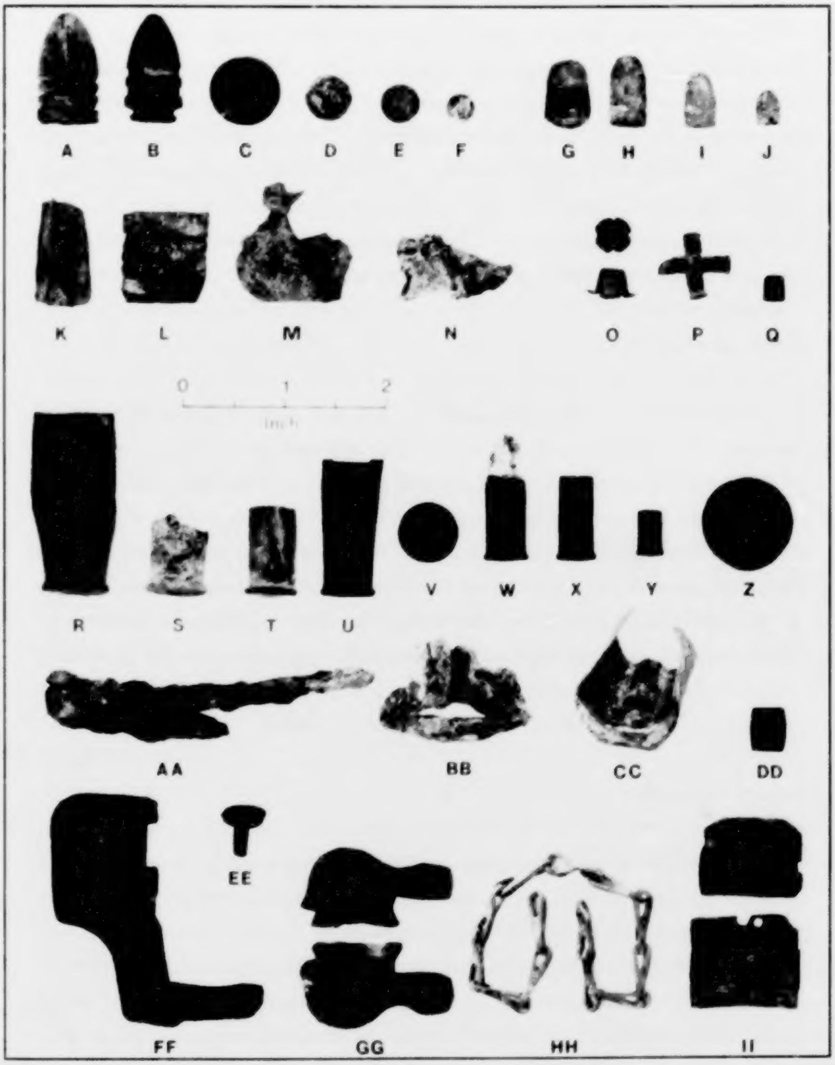
Ramrod Thimbles (3)

Three ramrod thimbles are represented (Fig. 19DD, II). The first is a machined brass tube, .3 inch long with an interior diameter of .315 inch--large enough to admit a quarter-inch ramrod without binding. A shallow lathe turned groove adorns each end of the thimble. Apparently, the object once attached to the stock by a wire loop or tenon, now broken off at the weld. Two other thimbles are manufactured from .75 mm-thick strips of sheet brass that are folded to create a one piece thimble and tenon. These are perforated and would have been mounted to the stock with a cotter. One thimble exhibits a tenon broken at a centrally placed perforation, requiring the drilling of a second off-center perforation--an obvious repair episode. Both specimens are smashed and diameter is indeterminate. The thimbles are 1.05 and .972 inches long. Martial weapons portrayed by Russel (1980) do not depict ramrod thimbles similar to any of the Fort Smith examples. All are typical of Indian trade rifles and civilian arms--notably the Kentucky long rifle.

Flashpan (1)

The excavation produced one cast brass flashpan, a distinctive feature of the model 1816 U.S. flintlock musket (Fig. 19GG). Manufactured by the Springfield Armory ca. 1816-1840, and by the Harpers Ferry Armory ca.

Figure 19. Arms Group Artifacts. A) .58 caliber Minie ball; B) .58 caliber Sharps bullet; C) .69 caliber round ball; D) .45 caliber round ball; E) .36 caliber round ball; F) Buckshot; G) Bullet from .45-70 Winchester round; H) .45 caliber bullet; I) .36 caliber bullet; J) .22 caliber bullet; K-L) Cut lead; M-N) Melted lead; O) Musket percussion caps; P) Exploded musket percussion cap; Q) Revolver percussion cap; R) .50-70 U.S. Government cartridge; S) .45-70 U.S. Government cartridge; T) .44 caliber Henry cartridge; U-V) .45-70 Winchester cartridge; W) .38 caliber Smith and Wesson round with Peters headstamp; X) .32 caliber cartridge; Y) .22 caliber cartridge; Z) 8-guage shotgun shell; AA) Rifle mainspring; BB) Rifle sling swivel; CC) Nosecap; DD) Ramrod ferrule; EE) Tumbler screw; FF) Revolver frame; GG) Flashpan from model 1816 U.S. musket; HH) Nipple protector chain from Enfield rifle; II) Ramrod ferrules.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1816-1844, the model 1816 musket is a .69 caliber weapon with a unique detachable, inclined, fenceless, brass flashpan (Russel 1980:154). Damage to the flashpan recovered at Fort Smith prevents an estimate of length, but the object is .9 inch wide with a .5-inch wide priming cavity. An integral, cast frizen screw arm is .55 inch long with a frizen screw arm hole diameter of .20 inch. Beginning in 1841, many of these weapons were converted to the percussion system of ignition. As late as the Civil War, model 1816 muskets were still being converted at the Confederate Armory at Marshall, Texas (Luke 1978:105).

Revolver Frame (1)

A section of brass revolver frame recovered at Fort Smith is of solid cast construction (Fig. 19FF). It exhibits a sighting groove and threaded socket for a .58-inch diameter barrel over a .25-inch diameter cylinder pin hole. Enough of the frame is intact to establish a height of 2.15 inches and width of .73 inch. The construction, small size, and distinctive shape of the frame suggests that this specimen may be an Allen & Wheelock .31 caliber, small frame, pocket percussion revolver (Flayderman 1983:58). The pistol was originally patented on April 16, 1845, and over 1,000 of these weapons were produced from ca. 1858 to the early 1860s. This handgun incorporates a bar hammer double action, five shot round cylinder, and late cylinder pin of the sliding type in its design.

Nipple Protector Chain (1)

One section of lightweight brass chain recovered at Fort Smith is a possible nipple protector chain from an Enfield rifle (Fig. 19HH). The chain is composed of two sections of brass "safety chain," each of six links, joined together by a single brass "jack chain" link (APT 1980:307). Safety chain links are formed by pinching a double-perforated brass strip together. The perforated ends of the link meet and form a loop for the next link. Thus, a safety chain link requires no weld. The single jack chain link is formed from a heavy guage wire bent to create two equal sized loops. The Russel and Erwin hardware catalogue of 1865 marketed safety chain of identical appearance in two sizes: 00 and 0 (APT 1980:307). The 1902 Sears Roebuck catalogue provided the same product for sash weights and offered a nickle plated version for stoppers and water-closet pulls (Sears and Roebuck 1902:544,655). Attributes of the chain from Fort Smith, however, suggest that it may have been a nipple protector chain. Lord (1982:190) portrays an identical brass chain with five safety chain links fastened to the nipple protector by a single jack chain link. Phillips (1980:150) illustrates two Enfield nipple protectors with brass chains. Like the Fort Smith specimen, both have six links of safety chain attached to the nipple protector by a simple jack chain link. The Enfield rifle is the only weapon used in the American Civil War that was supplied with an issue nipple protector.

Trigger (1)

One trigger is represented by the finger piece and partial blade. The trigger is .48 inch wide and 1.05 inches long. Although the weapon can not be identified, the trigger is similar to examples from the confederate arsenal at Marshall, Texas (Luke 1978:115). The 1855 rifle manual illustrates a trigger similar to the Fort Smith specimen (Scott 1861:7).

Sling Swivel (1)

An iron, rifle sling swivel from Fort Smith is an oval loop of heavy guage wire, .025 inch in diameter (Fig. 19BB). Exterior dimensions of the swivel are 1.52x.535 inch. Interior width indicates that the swivel would have harbored a 1-inch wide strap or sling. Sling swivels identical to the Fort Smith specimen occurred on many varieties of military long arms and attached to the trigger guard bow or middle barrel bands of these weapons. The 1855 rifle manual illustrates swivels identical to the specimen recovered here (Scott 1861:7).

Tumbler Screw (1)

Military arms required several specially machined screws. The 1855 rifle manual illustrates a tumbler screw similar in appearance to a screw in the Fort Smith collection (Scott 1861:4). The object is a brass screw with a flat, beveled, .45-inch diameter head, and a .35-inch long, flat-tipped stem that is only threaded .15 inch below the screw head (Fig. 19EE). The stem is mounted to the head in rivet fashion, creating two opposing off-center slots on each side of the stem. Overall length of the tumbler screw is .455 inch.

Percussion Caps (54)

The percussion ignition system was originally patented in 1807 by Reverend Alexander Forsyth. The common copper percussion cap containing fulminate of mercury was developed in 1816, and eventually adopted by a conservative United States War Department in 1841. One year later, the Ordnance Department directed the manufacture of a new percussion musket--primarily a model 1835 smoothbore weapon with a percussion lock. Conversion to the new system, however, required several years and the war with Mexico (1846-1848) was fought largely with flintlock weapons (Gluckman 1965:141, 157-159). Percussion caps experienced a 25-year hiatus in the military and were probably completely discontinued in 1866 with conversion to the Allin breech loading rifle (Gluckman 1965:239).

The excavation produced 54 copper percussion caps (Table MF.25). Formally, two varieties of caps are represented: pistol and musket caps (Fig. 19O-Q). Six recovered pistol caps are simple copper caps with flat tops and crimped, vertical sides. These are relatively small and range from .19 inch diameter to .24 inch long. Forty eight musket caps are formally distinct with a flat top, smooth vertical sides, and a flaring rim that lends a top-hat appearance to the cap. Musket caps range from .2-.25 inch in diameter and from .22-.28 inch in length. They display a wide range in variation that overlaps with pistol caps. The average pistol cap is .19 inch in diameter and .24 inch in length while the rugose musket cap averages .24 inch in diameter and .26 inch in length.

Cartridges

Thirty five metallic cartridges recovered at Fort Smith reflect a lengthy timespan and were produced from ca. 1845 to the present. Both centerfire and rimfire casings occur in a variety of calibers (Fig. 19R-Z, Table MF.26). Civilian and military rounds are both represented (Table 14).

.22 BB (2)

The .22 BB or "bulleted breech" cap is a rimfire cartridge developed in 1845 for the Flobert target rifle. This round is the oldest, self contained cartridge in the United States. The BB cap had been produced until about ca. 1945 (Barnes 1985:304).

.22 Short (7)

This round, introduced in 1857 for the Smith and Wesson First Model revolver, is widely used today (Barnes 1985:305). Three of the seven .22 Shorts recovered at Fort Smith exhibit headstamps. Two with the raised "H" probably represent the Winchester Repeating Arms Company, organized in 1866. A third example with raised "US" in a circle represents the American Metallic Cartridge Company and probably dates from 1864-1872 (Suydam 1960:166).

.32 Short (3)

Manufactured as a less powerful version of the .32 Long, the .32 Short rimfire cartridge originated under a Smith and Wesson patent of 1860. The round was first used in the Smith and Wesson New Model #1 1/2 and #2 revolvers but was later chambered for many types of weapons. Remington manufactured the cartridge as late as 1920. Only one of the three specimens from Fort Smith exhibits a headstamp. It is the raised "H," probably used by the Winchester Repeating Arms Company after 1866 (Barnes 1985:277).

.32 Long (2)

First produced in 1861 for the Smith and Wesson New Model No. 2 revolver, the .32 long rimfire cartridge was soon chambered for a variety of weapons. The round is still available. Both of the examples recovered at Fort Smith fall within the range of the .32 long round (Barnes 1985:309). Neither specimen displays a headstamp.

.38 Long (2)

The .38 long cartridge was developed before 1865. The round was chambered for the Remington Beals single shot rifle from 1867-1875 and the Remington revolving rifle of 1866. Many other revolvers and rifles were chambered for the .38 long, which remained popoular to the turn of the century. The .38 long was eventually supplanted by popular centerfire rounds and was taken out of production in the late 1920s (Barnes 1985:310). Two rimfire cartridges from Fort Smith fall within the prescribed range of the .38 Long cartridge. Neither specimen, however, is headstamped.

TABLE 14

Metallic Cartridges

OBS.	CARTRIDGE TYPE	IGN	CASE LENGTH	NECK DIA.	HEAD DIA.	SHOULDER DIA.	HEADSTAMP	DATE
1	.22 BB	RF	.277	.220	.255	.224	NONE	1845-CA 1945
2	.22 BB	RF	.277	.220	.255	.224	NONE	1845-CA 1945
3	.22 SHORT	RF	.412	----	.281	.200	NONE	1857-PRESENT
4	.22 SHORT	RF	.440	----	.260	.220	US	1864-1872
5	.22 SHORT	RF	.430	.220	.265	.232	NONE	1857-PRESENT
6	.22 SHORT	RF	.422	.222	.273	.222	H	1866-PRESENT
7	.22 SHORT	RF	.422	----	.263	.224	NONE	1857-PRESENT
8	.22 SHORT	RF	.447	.220	.265	.222	H	1866-PRESENT
9	.22 SHORT	RF	.432	.220	.270	.224	NONE	1857-PRESENT
10	.32 SHORT	RF	.536	----	.371	.335	H	1860-1920
11	.32 SHORT	RF	----	----	.356	.320	NONE	1860-1920
12	.32 SHORT	RF	.455	----	----	----	NONE	1860-1920
13	.32 LONG	RF	.815	.321	.377	.328	NONE	1861-PRESENT
14	.32 LONG	RF	.805	.320	.377	.327	NONE	1861-PRESENT
15	.38 LONG	RF	.800	----	.385	.360	NONE	CA 1865-1920S
16	.38 LONG	RF	.800	----	.418	.380	NONE	CA 1865-1920S
17	.44 HENRY SHORT	RF	.861	----	.510	.455	NONE	1860-1934
18	.44 HENRY SHORT	RF	.850	----	.500	.450	NONE	1860-1934
19	.44 HENRY SHORT	RF	----	----	----	----	NONE	1860-1934
20	.44 HENRY LONG	RF	.910	----	.518	.495	NONE	1860-1934
21	.38-40 WINCHESTER	CF	----	----	.521	.464	UMC/38 CFW	1874-
22	.38-40 WINCHESTER	CF	1.310	----	.520	.461	WRA CO/38 WCF	1874-
23	.38-40 WINCHESTER	CF	1.312	----	.516	.461	WRA CO/38 WCF	1874-
24	.38-40 WINCHESTER	CF	1.320	----	.520	.465	WRA CO/38 WCF	1874-
25	.38-40 WINCHESTER	CF	1.324	.418	.515	.464	UMC/38 CFW	1874-
26	.38-40 WINCHESTER	CF	----	----	.520	.460	WRA CO/38 WCF	1874-
27	.38-40 WINCHESTER	CF	1.300	----	.513	.460	WRA CO/38 WCF	1874-
28	.38-40 WINCHESTER	CF	----	----	.521	.460	WRA CO/38 WCF	1874-
29	.38-40 WINCHESTER	CF	----	----	.515	.464	UMC/38 CFW	1874-
30	.38 SMITH & WESSON	CF	.760	.365	.430	.377	PETERS/38 S&W	1877-PRESENT
31	.32-20 WINCHESTER	CF	1.280	----	.400	.346	"---2---"	1882-PRESENT
32	.50-70 US GOVERNMENT	CF	1.736	----	.640	.582	NONE	1866-1870
33	.45-70 US GOVERNMENT	CF	1.482	----	.600	.510	NONE	1873-1877
34	.45-70 US GOVERNMENT	CF	----	----	.600	.510	NONE	1873-1877
35	8-GUAGE SHOTGUN	CF	-----	.818	.880	.830	ILLEGIBLE	CA 1851-1925

.44 Henry (4)

Four .44 caliber rimfire cartridges are rounds from the model 1860 Henry rifle or its successor, the model 1866 Winchester. The Henry repeating rifle was manufactured by the New Haven Arms Company from 1860-1866. Although the Henry rifle was never standard military issue, about 10,000 of the weapons were sold to state militia forces. Others entered the service through individual purchases. In 1866, the company was reorganized as the Winchester Repeating Arms Company, which introduced its own repeating rifle, the model 1866 Winchester. Although this weapon replaced the Henry, it was chambered for the same round--either a short or long cased .44 caliber rimfire cartridge. To ensure ignition, both weapons used two firing pins that created linear depressions on opposite sides of the casing. All four Fort Smith examples bear the distinguishing double pin mark and are model 1860 Henry or model 1866 Winchester rounds. One is a long cased cartridge and the remaining three are the short cased version. The .44 caliber rimfire round went out of production around 1934 (Barnes 1985:280, 312).

.38-40 Winchester (9)

This centerfire cartridge case, introduced in 1874 for the model 1873 Winchester rifle, remained popular through the early twentieth century (Barnes 1985:59). Nine .38-40 Winchester cartridges were recovered at Fort Smith. Six rounds display the "W.R.A.Co/38 W.C.F." headstamp of the Winchester Repeating Arms Company. Three rounds are stamped with the Union Metallic Company designation, "U.M.C./38 C.F.W."

.38 Smith & Wesson (1)

One cartridge from Fort Smith is a .38 caliber centerfire Smith and Wesson round. The cartridge was developed about 1877 for the Smith and Wesson hinged frame revolver. The .38 caliber centerfire round is now the most widely adapted American revolver cartridge (Barnes 1985:190). The specimen from Fort Smith displays the "Peters/.38 S&W" headstamp of the Peters Cartridge Company.

.32-20 Winchester (1)

Introduced around 1882 for the Model 73 lever action rifle, the .32-20 Winchester round gained widespread popularity. Most American manufacturers chambered weapons for this round which is still available today (Barnes 1985). A single example of the .32-20 Winchester cartridge recovered at Fort Smith bears a headstamp that is illegible.

.50-70 Government (1)

One example of the .50-70 government round was recovered at Fort Smith. Introduced in 1866 for use with the Allin trapdoor Springfield rifle, the .50-70 cartridge is the first centerfire round issued in government service. The .50-70 cartridge recovered at Fort Smith has a Benet iron cup primer and is without the official government headstamp. Produced at the Frankfort Arsenal, the .50-70 government round did not incorporate the Benet primer until March, 1868. The round was loaded until August, 1870 (Barnes 1985:130). Thus, the Fort Smith .50-70 cartridge dates to this two year time span and is probably associated with the late military occupation of the site.

.45-70 Government (2)

Beginning in 1873, the Allin trapdoor Springfield rifle was rechambered for the .45-70 government round. This cartridge was not replaced until adoption of the .30-40 Krag in 1892. Both examples from Fort Smith display the Boxer external primer and are without headstamps. The Frankfort Arsenal did not stamp all products until 1877. Therefore, the .45-70 rounds from Fort Smith may date to the five year interval from 1873-1877 (Barnes 1985:84). Although a military round, the .45-70 cartridge at Fort Smith probably indicates a civilian association.

8-Guage Shotgun Shell (1)

One example of a paper-cased 8-guage shotgun shell was recovered at Fort Smith. The centerfire breech loading shotgun was improved in 1851 and 8-guage shells were loaded as late as 1925 (Barnes 1985:316, 319). This civilian sporting weapon was a typical long range gauge for wildfowl. Hunting was a popular pastime among soldiers and apparently, the shotgun was used as a sporting weapon. Shotgun casings have been identified at other nineteenth century military posts including: Fort McKavett (Black et al. 1980:225), Fort Sill (Spivey et al. 1977:133), Fort Richardson (Westbury 1977:69), Fort Bowie (Herskovitz 1978:51) and at Fort Washita (Lewis et al. 1975:123).

Lead Projectiles

The excavation resulted in the recovery of 128 lead objects that reflect bullet production and use (Fig. 19A-H). A variety of projectiles from military and civilian rounds are evident (Table MF.27) as are manufacturing biproducts (Table MF.28).

.69 Caliber Ball (1)

For rapid reloading, smoothbore rounds are always smaller than bore diameters. From 1849-1861, official cartridge guidelines specify a .65-inch diameter ball for the .69 caliber musket (Lewis 1968:110-114). One .67-inch diameter ball from Fort Smith is for a .69 caliber weapon and could have been used with a variety of martial arms (Fig. 19C). The model 1842 musket was the last .69 caliber smoothbore weapon used by the military. In 1855, a new .58 caliber rifle musket for use with a conical, hollow-base projectile known as the "Minie ball" was adopted. After this date, the model 1842 muskets in service were rifled and used with a .69 caliber Minie ball. In the following decade, the round ball for military long arms was gradually replaced. The .69 caliber ball was used throughout the Civil War, first as a round for long arms and later as an artillery case shot (Kerskis 1955:73). Round balls are present at Fort Lancaster (Black 1975:40, 144), Fort McKavett (Black et al. 1980:225), Fort Towson (Lewis 1968:56-71), Fort Washita (Lewis et al. 1975:58, 120), and at Fort Bowie (Herskovitz 1978:46)--all posts with pre-Civil War occupations. At Fort Richardson, occupied in 1867, round balls were not recovered (Westbury 1977).

.52 Caliber Ball (1)

One .526-inch diameter round ball falls within the range of cartridges for the .52 caliber Halls' rifle and pistol. Official specifications require a .525-inch diameter ball for these weapons (Lewis 1968:115). Patented in 1811, the Halls' rifle is a unique breech loading, flintlock weapon with rifled barrel. In 1819, the United States Military adopted the firearm and before 1843, some 30,000 stands of the weapon had been manufactured (Russel 1980:188). The Halls' rifle and pistol were used in the Mexican War and to a limited degree, in the Civil War by Union and Confederate troops.

.44 Caliber Ball (3)

Three round balls are probably for use with the .44 caliber army revolver. Several private manufacturers produced their version of the popular army model weapon--all in .44 caliber. These include the Remington Model 1861, Starr model 1858, and the Colt model 1860. According to 1861 cartridge specifications, the army revolver used a .46-inch diameter ball (Lewis 1968:124) for a tightly chambered round (Coggins 1987:41). The examples from Fort Smith range in diameter from .42-.445 inches. Over 146,000 Colt revolvers were purchased by the government during the Civil War and undoubtedly, thousands more were privately purchased by soldiers in the field (Coggins 1987:4).

.36 Caliber Ball (2)

Two .36 caliber round balls are probably for the navy pattern revolver. Several companies produced the popular .36 caliber weapon and include the Savage and North model 1856, Starr model 1858, Remington model 1851 and model 1861, and the Colt model 1851 and 1861 (Coggins 1987:41; Hogg 1987:1). According to official cartridge specifications, the navy revolver required an oversized .39-inch diameter cartridge (Lewis 1968:124) for a well chambered load (Coggins 1987:41). Both examples from Fort Smith are .374 and .370-inches in diameter, respectively.

Minie Ball (7)

Called "expanding ball" in the 1861 cartridge specifications, the Minie ball is a pointed, hollow base projectile with three canneleures surrounding its base. Cast in two calibers, official guidelines require a .577-inch diameter base for the .58 caliber weapon and a .685-inch diameter base for the .69 caliber weapon (Lewis 1968:124). The Minie ball became an official military round with adoption of the .58 caliber rifled musket in 1855 (Logan 1959:16-17). Many of the older model 1842 muskets were rifled and used with the .69 caliber Minie ball. By the late 1850s, this projectile had almost replaced the round ball in government service. New rifle musket models that used the Minie ball were adopted in 1861, and again in 1863 (Gluckman 1965:195-197). The model 1863 rifle musket was the last muzzle loading shoulder arm ever issued. In 1866, the army adopted the Allin breech loading rifle (Gluckman 1965:239) and the Minie ball was phased out as soon as the new weapon was made available. Seven Minie balls were recovered at Fort Smith (Fig. 19A). Six unfired specimens range from .568-.576 inch in diameter and from 29.3-33.7 grams in weight. All are for use in a .58 caliber weapon.

Sharps' Bullet (12)

Twelve Sharps' bullets are present in the collection (Fig. 19B). This distinctive bullet is a pointed projectile with two canneleures and a solid base with foot ring. Also called a tie-on groove, the foot ring served as a point of attachment for a linen or paper cartridge. Christian Sharps developed the unique round in 1852 for use with an early breech loading weapon. Because of its rapid reloading capabilities, Sharps' rifle gained favor with the United States Military as a cavalry weapon. The Sharps' rifle was used in the 1850s and through the Civil War. Many troops were armed with the weapon at their own expense. The rifle and its distinctive round were probably discontinued in 1866, after adoption of the Allin breech loading rifle (Gluckman 1965:237). According to the 1861 cartridge specifications, a .58 caliber Sharps' rifle uses a .56 inch diameter cartridge. Some odd size calibers like the .52 were used by the Confederate Army (Lewis 1968:110). Eleven of the Fort Smith bullets are for a .58 caliber weapon. These are .550 inch in diameter and range from 28.6-29.4 grams in weight. A single bullet is, apparently, for use with the .52 caliber Sharps' rifle. It is a .515 inch diameter bullet that weighs 27.8 grams.

Cartridge Slugs (8)

Nine lead projectiles are elongated, conical-shaped bullets (Fig. 19G-J). All appear to have been used with metallic casings in civilian weapons. Two round nose bullets of .4 and .401 inch diameter are probably from the .38-40 caliber round introduced in 1874 for the Winchester model 73 (Barnes 1985:80). A .373-inch diameter bullet and a .371-inch diameter bullet with round nose and double canneleures are .38 caliber rounds. First introduced in the early 1860s for the Prescott and Bacon revolver, the .38 caliber cartridge was used with a variety of other weapons (Barnes 1985:310). One .356-diameter bullet--still in the casing--is identified as a .32-20 Winchester round introduced in 1882 (Barnes 1985:62). A .306-inch diameter bullet with round nose and a single canneleur is from a .32 caliber cartridge. The first weapon to use a metallic cased .32 caliber cartridge is the Smith and Wesson New Model #2 revolver introduced in 1861 (Barnes 1985:309). A single .25 caliber weapon is represented by a .242-inch diameter bullet with pointed nose and a belted base. Originally developed ca. 1860, for the Bacon and Bliss revolver, the .25 caliber cartridge was adapted for numerous other cheap handguns to ca. 1920 (Barnes 1985:307). One .22 caliber bullet with a round nose and two canneleures was recovered. The .22 caliber is the oldest American metallic cartridge. It was introduced in 1857 for the first Smith and Wesson revolver (Barnes 1985:305).

Unidentified projectile (5)

Five lead projectiles are too distorted to be identified by form or caliber. All display indications of impact, however, and do represent balls or bullets.

Buckshot (13)

Thirteen buckshot represent seven standard sizes ranging from 000 to No. 4 buck. Used by both civilians and the military, buckshot came in sporting and combat rounds. Beginning in 1837, the army used a "buck and ball" round consisting of three 00 buckshot and a .64-inch diameter ball in a paper cartridge (Kerskis 1955:73; Lewis 1968:110). Only one 00 buckshot occurs in the collection and .64-inch diameter balls were not recovered. If the buck and ball round was ever used on the Arkansas frontier, it is not well represented at Fort Smith. The .3-inch diameter No. 1 buck is the most common shot recovered and is probably from a sporting round. Two 000 buckshot are present as are two 0 buckshot and single examples of Nos. 2, 3, and 4 buckshot.

Shotgun Pellets (2)

Because of their diminutive size, shotgun pellets are poorly represented in the collection. Two examples, No. 4 and No. 5 pellets, were recovered and are from sporting rounds.

Casting Debris

The presence of lead casting debris indicates that some bullet production occurred at the site. Five categories of lead artifacts--believed to reflect casting activity--are evident. These are lead sprue, miscast ball, cut lead, melted lead, and hammered lead.

Sprue (1)

One lead sprue indicates bullet production in a multiple cavity mold. At least two cavities are evident.

Miscast Ball (2)

Two incompletely cast round balls are present and represent failed production attempts. Molten lead poured into a cold bullet mold solidified before the entire cavity could be filled, leaving only the upper portion of a round ball. Neither specimen was complete enough to determine their diameters.

Cut Lead (10)

Ten segments of cut lead are present. All specimens exhibit cuts from a broad bladed tool and were evidently sectioned with a hatchet or chisel (Fig. 19K-L). Thicknesses range from .1-1.75 inch and suggest that cut lead originated from sheets or small bars. The average specimen is .36 inch thick. Although the size and form of the product he received is unknown, the Fort Smith quartermaster ordered quantities of lead (Bento 1988:14). Presumably, sectioning lead stock produced forms more amenable to the casting process.

Melted Lead (44)

Forty-four drops of melted lead probably resulted from spills during bullet casting (Fig. 19M-N). Melted lead ranges in size from 1.0-47.8 grams. The average specimen weighs 6.9 grams.

Hammered Lead (16)

Sixteen hammered or flattened lead objects were recovered. Although lead projectiles in the collection often exhibit intentional hammering, the original form of objects included here can not be determined. Hammered lead artifacts range in size from 1.4-36.1 grams with an average size weighing 8.2 grams. Hammered or misshapen lead objects may represent recycling of used or damaged projectiles in the casting process. Two lead projectiles--described in previous sections--do display intentional hammering.

Canister Shot (2)

Two spherical, cast iron projectiles are canister shot (Table MF.29). This close range artillery ammunition contains 1.5-inch diameter iron shot packed in a tin canister or shell with a time delay fuse (Coggins 1987:67). Apparently, size of shot varies considerably. Canister shot recovered at Fort Washita ranges in size from .2-.6 inch in diameter (Lewis et al. 1975:186). The Fort Smith examples are both larger and are .7 and 1.15 inches in diameter.

CLOTHING GROUP ARTIFACTS

Eight classes of artifacts are included within the clothing group. These are straight pins, shoe leather, grommets (of small diameter), clothing fasteners, garment stay, military accouterments (items worn or carried on a soldier's person), military buttons, and civilian buttons.

Straight Pins (21)

Twenty-one straight pins from the pedestrian trail excavation are formally identical (Table MF.30). Straight pins reflect simple one-piece construction with solid, convex-shaped heads, and long shanks that gradually taper to points (Fig. 20B). Seven straight pins display evidence of silver finish although all specimens are manufactured from a cuprous base metal. Measurable pins indicate wide variation in size. Lengths range from .95-1.35 inch. Modal length is 1.25 inch while the average length among six measurable examples is 1.18 inch.

Two straight pins are associated with a rectangular sheet copper back, 1.75x.15 inch, with four perforations or pin holes (Fig. 20C). Straight pins inserted in two pin holes are intentionally bent or encircled, with the point touching the pin head, so that the pins will not slip from the copper back. The device is probably a makeshift clothing fastener.

Pins with solid heads like the Fort Smith specimens, were first manufactured in 1824 (Noel Hume 1980:254). Straight pins are not commonly recovered at nineteenth century military posts but have been found at Fort Washita (Lewis et al. 1975:118).

Shoe Leather (13)

Thirteen fragments of leather in the Fort Smith collection are probably from footwear (Table MF.31). These range in thickness from .08-.17 inch and display a mean thickness of .108 inch. Seven examples have stitching holes. Three examples are obvious shoe or boot soles (Fig. 20A).

Grommets (2)

Two grommets in the Fort Smith collection are relatively small copper eyelets of one-piece construction (Fig 20F, Table MF.32). Both have exterior diameters of .257 and .23 inch and interior diameters of .14 and .122 inch, respectively. Thus, the eyelets would admit only lightweight cordage. One specimen contains a fine, woven white fabric--apparently cotton. Both grommets are probably from articles of clothing.

Clothing Fasteners

Fifteen artifacts are devices for fastening or adjusting clothing (Table MF.32). Six categories are evident: suspender buckle, waist belt buckle, shoe buckle, cap strap slide, unidentified strap buckle, and hooks and eyes.

Suspender Buckle/Slide (2)

A suspender buckle and associated slide were recovered at Fort Smith. The rectangular iron buckle, .9x1.16 inch, contains a centrally placed, stationary bar with two prongs (Fig. 20I). Width of the interior compartments indicates that the suspender strap was .875 inch wide.

The suspender slide, stamped from sheet brass, consists of two different sized loops separated by a stationary center bar. The first loop is for a .9-inch wide strap and the second loop is for a 1.13-inch wide strap. A fragment of black woven cloth, preserved by copper salts, was found in the larger loop.

Although suspenders were not regulation issue until 1883 (Chappell 1972:39), they are found on many military sites. Suspenders are represented at Fort Sill (Spivey et al. 1977:106), Fort Richardson (Westbury 1977:74), Fort Bowie (Herskovitz 1978:38), Fort McKavett (Black et al. 1980:259), and at Fort Washita (Lewis et al. 1975:64, 189).

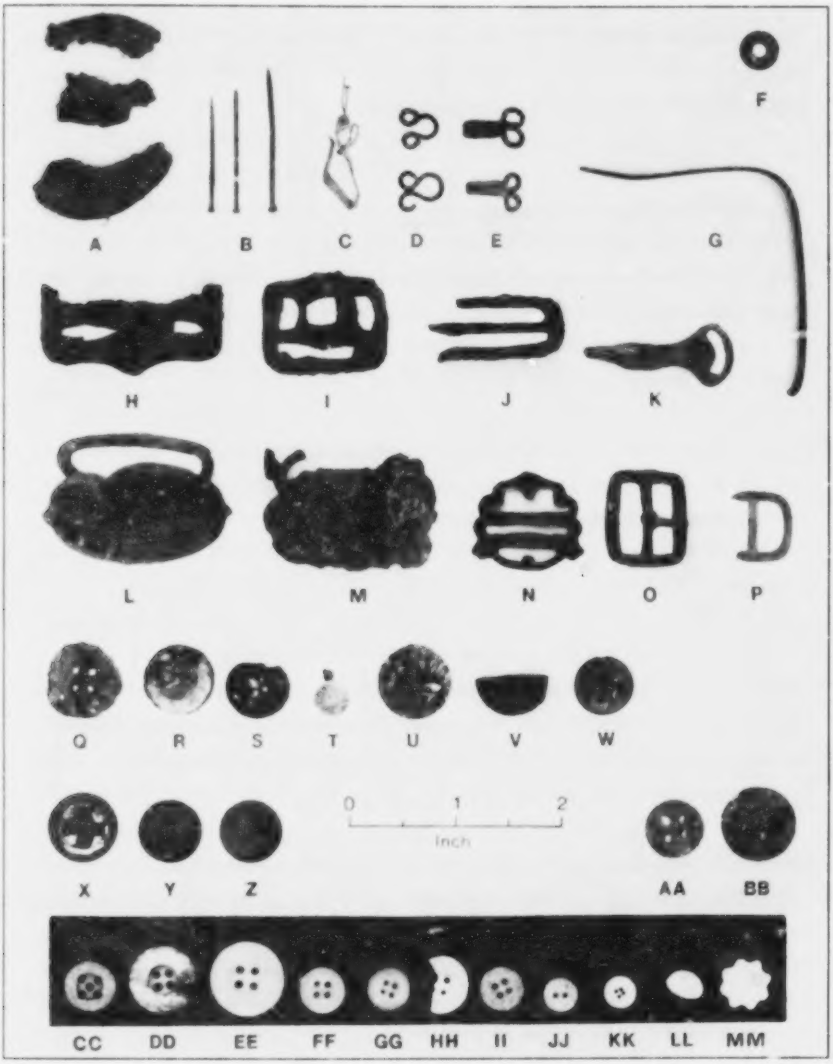
Unidentified Strap Buckle (1)

An ornate stamped brass buckle is a realistically fashioned goose head (Fig. 20K). The proximal end of the buckle has a loop to accomodate a .46 inch wide strap. Two perforations at the jaw of the goose are apparently for a catch--now missing. The buckle is 1.4 inch long, .212 inch thick, and .6 inch wide at the loop. The object may be a watch fob ornament or ladies' waist belt buckle.

Shoe Buckle (1)

A small, rectangular-shaped brass buckle with center bar and round tongue, is probably a shoe buckle (Fig. 20O). Stamped from .04-inch thick sheet brass, the buckle measures .9 inch wide and .75 inch long. Interior width

Figure 20. Clothing Group Artifacts. A) Shoe leather. B) Straight pins. C) Straight pins in brass backing. D-E) Hooks and eyes. F) Small grommet or clothing eye. G) Garment stay. H) Iron buckle. I) Suspender buckle. J) Belt slide. K-N) Ornate ladies' belt buckles. O) Shoe buckle. P) Cap strap slide. Q) Variety 1 pressed steel button. R) Variety 2 pressed steel button. S) Variety 6 brass button. T) Watchcase button. U) Hard rubber button. V) Back of molded glass button. W) Variety 2 brass button. X) Possible Hospital Corps button with Geneva cross. Y) General service button with line eagle device. Z) Ordnance Department button with crossed cannon. AA-BB) White-metal fatigue buttons. CC) Variety 1 bone button. DD) Variety 3 bone button. EE) Variety 1 porcelain button. FF) Variety 6 porcelain button. GG) Variety 12 porcelain button. HH-II) Porcelain buttons with transfer printed designs. JJ) Variety 6 shell button. KK) Variety 2 shell button. LL) Variety 15 porcelain button. MM) Variety 1 glass button.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indicates that the buckle would have accomodated a .665-inch wide strap.

Cap Strap Slide (1)

One stamped sheet brass slide is square, .675x.675 inch, with rounded corners (Fig. 20P). A stationary center bar separates the slide into two equally sized loops for a .465-inch wide strap. The cap strap slide differs from the regulation specimens described under accouterments, and is probably from civilian headgear.

Waist Belt Buckle and Slide (5)

Five artifacts are associated with waist belts. These include two iron slides and three ornate, stamped brass buckles--probably representing ladies' waist belts. An 1895 catalogue illustrates "ornate gilded ladies waist belts, highly embossed with ornate slides and buckles" (Montgomery Ward 1895:99) that are similar to those recovered at Fort Smith.

Two waist belt slides are both unadorned, iron belt accessories. One is a simple oval loop with center bar that creates two equal compartments (Fig. 20J). The slide is .61 inch wide, but length could not be measured. A second, partial iron slide is rectangular, 1.0x1.7 inch, with a stationary center bar (Fig. 20H). Two equal sized compartments would have accomodated a 1.35 inch wide belt.

A third specimen is an ornate, stamped brass, ladies' waist belt buckle (Fig. 20L). The oval shaped buckle, 1.82x1.25 inch, exhibits an integral loop for a 1.22-inch wide strap. Soldered to the ventral side of the buckle, opposite the strap loop, is a .55-inch long catch made of sheet brass. The dorsal surface of the buckle bears an intricate molded design. At the center is a log in the grasp of a coiled serpent. The coils grow progressively larger until the last coil opens to form a border around the buckle. The intervening open field is filled with raised flowers of five petal design. Because an identical object was recovered at a Civil War battlefield, Stanley Phillips (1980:115) has ascribed a military function to the buckle, calling it an "unknown badge or insignia." Apparently, the example inspected by Phillips had neither catch nor strap loop.

Another stamped brass buckle also bears an ornate design that consists of a centrally placed shield surrounded by a flower and scroll design (Fig. 20M). The shield contains a centered floral motif and a bird perched on its top edge. The buckle measures 1.58x1.6 inch. Although the belt loop is missing, the ventral surface of the buckle has the same type of catch as the preceding example.

A third ladies waist belt buckle is a complex shaped object that is 1.05 inches wide and .92 inch long (Fig. 20N). Two centerbars create three compartments or loops. Both outer loops have integral tongues or catches to fasten the belt in place. Internal width of the buckle indicates a .8-inch wide belt.

Hooks and Eyes (6)

Hooks and eyes are garment fasteners generally used on dresses during the nineteenth century. Four eyes and two hooks occur in the Fort Smith collection (Fig. 20D-E). The eyes are constructed of brass wire filaments. Three have square cross-sections and the fourth is made from a round wire. The wires are bent to create a loop or eye and recurved at the ends to form two sew-through holes for fastening the eye to a garment. Eyes range in size from .2 to .3 grams. Two hooks in the sample are produced from square wire filaments, curved to form a hook. Hook ends are recurved to create two sew-through holes for mounting the fastener to a garment. One eye and one hook bear evidence of silver electroplating.

Hooks and eyes do not commonly occur at military posts but are present in limited numbers at Fort Washita (Lewis et al. 1975:187, 252) and at Fort Lancaster where Black infers that these fasteners were used on military garments (Black 1975:39, 42). In actuality, hooks and eyes were used on dresses and one manufacturer proclaimed them "indispensable to every dress to take the place of silk loops" (Sears and Roebuck 1902:946). The Montgomery Ward Company (1895:89) marketed hooks and eyes finished in adamantine, silvered, or Japanned. Three sizes were offered that could be purchased by the card, gross, or great gross. The Sears Roebuck catalogue (1902:946) refers to similar specimens as "swan bill hooks and eyes" of brass, Japanned, or silvered finish. These were marketed in two sizes.

Garment Stay (1)

One cuprous metal strip recovered at Fort Smith has a partial length of 3.9 inches, is .17 inch wide, and .028 inch thick. Preserved by copper salts, a herringbone fabric impression covers the surface of the object, indicating that it may have functioned as a clothing or garment stay (Fig. 20G). The 1895 Montgomery Ward catalogue (1895:89) lists cloth-covered dress stays in lengths of 7, 8, 9, and 10 inches.

BUTTONS

The pedestrian trail excavation produced 237 buttons. This is the largest class within clothing group artifacts. Both civilian and military buttons are represented.

Civilian Buttons

A total of 148 buttons are civilian (Table MF.34). Based on variation in size, these once adorned overcoats, shirts, dresses, trousers, and undergarments. Many of these specimens may have originated from civilian employees housed at the post or from the dependents of married soldiers. In the absence of specifications for shirt and undergarment buttons preceding 1889 (USG 1986), it is likely that many civilian buttons were used by the troops. In 1851, the quartermaster at Fort Smith had 42 underdrawers and 46 cotton shirts on hand. Occasionally, the numbers swelled much higher, for in 1857 the quartermaster had 1,975 shirts stockpiled at the post. These were in addition to quantities of regulation uniform clothing (Bento 1988:115-116). Based on composition, shape, and color, seven basic button types with 35 variations are recognizable.

Porcelain Buttons

Porcelain and glass buttons are often confused in historic site reports and at one military site have been misidentified as plastic (eg. Lewis et al. 1975:127). Seventy-eight buttons at Fort Smith were classified as porcelain. Eighteen of these were broken or had a discontinuous glaze and the underlying paste was clearly visible. All others had a pebbled surface on the reverse face from incomplete glazing. This characteristic is believed to be a definitive trait of porcelain buttons.

Porcelain buttons have a wide temporal distribution. Stanley South places them in a post-1850 context (South 1974:243). Plain porcelain buttons occur with some frequency at military posts, including Fort Bowie (Herskovitz 1978:29), Fort Lancaster (Black 1975:42, 75), Fort McKavett (Black et al. 1980:259), Fort Griffin (Olds 1969:60), Fort Sill (Spivey 1977:98), and Fort Washita (Lewis et al. 1975:127). Calicoes or porcelain buttons with transfer printed designs, usually worn on dresses, are not common at military posts.

Variety 1 (55)

Most of the porcelain buttons (70%) recovered at Fort Smith are formally similar. These plain, white buttons are circular, have a biconvex cross-section, and a recessed face with four sew-through holes (Fig. 20CC). Variety 1 buttons range widely in size from .3-.57 inch in diameter.

Variety 2 (2)

These circular, biconvex, four-hole sew-through buttons with recessed face are formally identical to variety 1 buttons. Both variety 2 buttons, however, are blue. One measurable specimen is .42 inch in diameter.

Variety 3 (2)

Two buttons, formally identical to variety 1 buttons, are black. These range in size from .432-.427 inch in diameter.

Variety 4 (1)

A single button is circular with biconvex cross-section and recessed face that contains four sew-through holes. The specimen is formally similar to variety 1 buttons with one exception--it is green. The variety 4 button is .42 inch in diameter.

Variety 5 (2)

Two similarly appearing buttons are white, circular buttons with biconvex cross-sections, and recessed faces containing four sew-through holes. Both specimens are adorned with a beaded border design and range in size from .4-.425 inch in diameter.

Variety 6 (3)

Three white porcelain buttons are similar to the variety 5 buttons and display a biconvex cross-section with recessed face for four sew-through holes. Variety 6 buttons, however, are decorated with a gadrooned border motif of repeating ridges (Fig. 20FF). The recovered examples range from .35-.44 inch in diameter.

Variety 7 (1)

One round, white procelain button with biconvex cross-section, recessed face, and four sew-through holes exhibits a blue floral, transfer print decoration (Fig. 20II). Porcelain buttons with transfer print designs or "calico buttons" were made ca. 1840, in England. In 1848, a button plant at Greenpoint, New York, began manufacturing calico buttons. Used primarily on dresses and secondarily on shirts, calico buttons were marketed in over 293 designs, eight colors, and 15 sizes (Brown 1964:46-47).

Variety 8 (1)

One round, .445-inch diameter, white porcelain button with two sew-through holes in groove, is decorated with a red floral transfer print design. This specimen probably postdates 1848, when calico buttons were first manufactured in the United States (Brown 1964:46-47).

Variety 9 (4)

Four plain, white porcelain buttons are dish-shaped, four-hole sew-through buttons with raised border rims. The recovered examples range from .325-.62 inch in diameter.

Variety 10 (1)

One button, formally identical to variety 9 buttons, is dish-shaped with raised border rim and four sew-through holes. The variety 10 button, however, is black. The single specimen is .4 inch in diameter.

Variety 11 (1)

A single white, dish-shaped button with raised border rim that surrounds four sew-through holes, is a calico button. The button surface is covered with a green, transfer print polka-dot design (Fig. 20FF). Calico buttons probably postdate 1848 in the United States (Brown 1964:46-47). The single variety 11 button is .42 inch in diameter.

Variety 12 (1)

One white porcelain button is a biconvex, circular button with depressed center and four sew-through holes. The only hand painted button in the collection, this example is decorated with a red border line on the button edge (Fig. 20GG). The variety 12 button is .42 inch in diameter.

Variety 13 (1)

A distinctive porcelain button is round and biconvex with depressions on both surfaces that contain four sew-through holes. On the obverse surface, a raised border rim surrounds the button. This formally unique button is also the only ivory colored specimen in the collection. The variety 13 button is .39 inch in diameter.

Variety 14 (2)

Two buttons are conical, white porcelain specimens, threaded for a steel eye (Fig. 20LL). Two sizes are evident: a .465-inch diameter by .257-inch high button and a .35-inch diameter by .2-inch high button.

Shell Buttons

Twelve shell buttons occur in the Fort Smith sample. Shell buttons may be as early as 1788, but were not important in the United States until the 1850s (Spivey et al. 1977:99). Shell buttons remained popular through the second half of the nineteenth century. The 1895 Montgomery Ward catalogue lists shell or "pearl buttons" for cloaks, jackets, dresses, shirts, etc. (Montgomery Ward 1895:85). Shell buttons occur at other military posts including Fort Washita (Lewis et al. 1975:64, 189, 259), Fort Richardson (Westbury 1977:73), Fort Lancaster (Black 1975:143), Fort McKavett (Black et al. 1980:259), Fort Towson (Lewis 1972:71), and Fort Sill (Spivey et al. 1977:100) and may indicate their use by the military on pre-1889 undergarments.

Variety 1 (1)

One shell button in the collection exhibits a biconvex cross-section and a countersunk face that contains three sew-through holes. The specimen is .315 inch in diameter.

Variety 2 (4)

Most of the shell buttons (33%) are formally similar. These have a planoconvex cross-section and four sew-through holes in a countersunk depression on the button face (Fig. 20KK). Variety 2 buttons range from .308 to .383 inch in diameter.

Variety 3 (3)

Three examples or 25% of all shell buttons are formally identical to variety 2 buttons but are decorated with an engraved dot border that encircles the button edge. The recovered specimens range from .288-.344 inch in diameter.

Variety 4 (2)

Two specimens are flat, circular shell buttons with countersunk faces that contain four sew-through holes. Variety 4 buttons are .317 and .338 inches in diameter.

Variety 5 (1)

A single .355-inch diameter button is a simple, flat, circular disk without countersunk face. Four sew through holes are present for attaching the button to a garment.

Variety 6 (1)

One planoconvex, two-hole sew-through button is not countersunk. Diameter of the variety 6 button is .328 inch (Fig. 20JJ).

Rubber Buttons

In 1851, Charles Goodyear Jr. patented the vulcanization process for producing hard rubber (Herskovitz 1978:132). Molded hard rubber objects, including buttons, quickly gained acceptance and by 1855, the Novelty Rubber Company was organized for their production. Two hard rubber buttons from Fort Smith represent as many varieties.

Variety 1 (1)

The single variety 1 button is a .7-inch diameter, .25-inch thick, circular button with a biconvex cross-section. The button is a two-hole sew-through type. The button face depicts a molded shell design and hints of pigment on the button surface indicate a white lacquer finish (Fig. 20U).

Variety 2 (1)

One hard rubber button is a two-hole-in-slot sew-through type. The .6-inch diameter, .15-inch thick button has a convex back and a flat face with beveled edge. The button back is embossed "Novelty Rubber Co." and, therefore, postdates 1855 when this company was founded.

Glass Buttons

Two molded glass buttons recovered at Fort Smith represent two varieties. Both are constructed by pressing a spirally wound glob into a mold (Fig. 20V). According to Spivey et al. (1977:98), glass buttons were introduced in the United States in the 1860s.

Variety 1 (1)

A single variety 1 button is made of opaque glass with a planoconvex cross section. Eight molded ridges emanate from the center of the button face creating the impression of flower petals (Fig. 20MM). A brass wire loop imbedded in the reverse side of the button serves as the sew-through eye.

Variety 2 (1)

The variety 2 button is a black glass button, .685 inch in diameter and .295 inch thick, with a planoconvex cross-section. The button face exhibits a molded shell pattern. A depression on the button back once contained a wire tie-on loop.

Brass Buttons

Ten brass buttons at Fort Smith can not be identified as military issue and so are believed to be civilian buttons. Seven different varieties of civilian brass buttons are evident.

Variety 1 (1)

One composite button is represented only by a brass shell. Corrosion on the reverse of the shell, however, suggests that the missing back is constructed of pressed steel. The button face is flat and unadorned, and is .45 inch in diameter and .135 inch thick.

Variety 2 (1)

A single composite button with brass shell and steel back is present in the collection. The back is highly corroded and the configuration of the shank can not be determined. The shell exhibits a liberty head device surrounded by 13 stars (Fig. 20W). Remnants of a gilted surface are evident. The variety 2 button is .55 inch in diameter.

Variety 3 (1)

A third, composite brass civilian button is represented by a brass shell folded over a pressed steel back with Sanders'-type loop shank. The .5-inch diameter button is adorned with a four-petal flower device. A similar button from Fort Washita is identified as a "yellowmetal rose button" (Lewis et al. 1975:125).

Variety 4 (3)

Three buttons from Fort Smith are one piece circular buttons struck from brass with an omega-type wire loop soldered to the back. All three specimens exhibit plain surfaces. One has a gilt surface and manufacturer's backmark that is partially legible: "-B- ---ND." These buttons range in thickness from .015-.05 inch and from .535-.828 inch in diameter.

Variety 5 (1)

One round, pressed brass button with Sanders'-type eye is a watchcase button (Fig. 20T). The .332-inch diameter, spherical button exhibits a gilted surface and one chain link is attached to the eye.

Variety 6 (1)

Three buttons in the collection are simple, one piece, stamped brass, four-hole sew-through buttons with recessed centers (Fig. 20S). Although such buttons are not described in official specifications, five were recovered at Fort Washita (Lewis et al. 1975:63) and may suggest a military association. The three Fort Smith specimens range from .475-.608 inches in diameter. All are backmarked but only two examples are legible. An unknown backmark on one specimen is a stamped band of four-petal flowers interspersed with dots between two parallel lines. The second legible mark "B. BURNHAM/MAN.G CO" dates to the 1843-1849 period (Albert 1976:464).

Pressed Steel Buttons

Twenty three buttons recovered at Fort Smith are four-hole sew-through buttons made of pressed steel. Similar specimens have been recovered at the first Fort Smith (Dollar 1966:22), at Fort Sill (Spivey et al. 1977:96-97), Fort Washita (Lewis et al. 1975:125), Fort Bowie (Herskovitz 1978:38-39), at Kiowa and Comanche Indian Agent Commissaries (Crouch 1978:152), at Fort Lancaster (Black 1975:75), Fort McKavett (Black et al. 1980:259), at Fort Griffin (Olds 1969:60), and at Fort Richardson (Westbury 1977:74-75). The presence of pressed steel buttons at these nine sites may imply a military association. Herskovitz (1978:41) believes that two-piece metal buttons--once Japanned--are suspender buttons formally adopted by the Army in 1885. Their presence at Fort Smith, however, may indicate an informal use of the button--perhaps on nonregulation suspenders--prior to 1885. Most of the pressed steel buttons from Fort Smith are poorly preserved but at least two varieties are recognizable.

Variety 1 (20)

Twenty pressed steel buttons exhibit two piece construction. Two circular metal disks are stamped together and the top half is crimped or folded over the back (Fig. 20Q). A slight depression on the button face contains four stamped sew-through holes. Only one specimen exhibits a former finish and it was gilted. Variety 1 buttons range from .53-.7 inch in diameter and modal diameter is .7 inch.

Variety 2 (3)

Three buttons are constructed of two pieces of steel pressed together. These exhibit a recessed center with four sew-through holes. A cross-hatched band encircles the button face. Unlike variety 1 buttons, the steel components of the examples considered here do not overlap. The entire surface of the button is sheathed with a thin layer or plate of sheet brass (Fig. --R). Two measurable specimens are .66 and .675 inch in diameter. Variety 2 buttons are formally identical to the pattern 1885 "overall, stable frock, and drawers" button described by Herskovitz (1978:38) except that his specimens are made of whitemetal.

Bone Buttons

Twenty-one bone buttons were recovered at Fort Smith. All are relatively large buttons and as Brown (1957:53) infers, are probably coat buttons. Bone buttons are consistently recovered at other military posts including Fort Richardson (Westbury 1977:79), Fort Griffin (Olds 1969:60), Fort Sill (Spivey et al. 1977:101), Fort Bowie (Herskovitz 1978:129), and Fort Washita (Lewis et al. 1975:125, 189). The Fort Smith specimens are similar, turned-bone disks with sew-through holes for attaching to a garment. Nineteen formally identifiable buttons indicate the existence of three types.

Variety 1 (3)

Three buttons are flat, circular bone disks with countersunk faces that contain five sew-through holes (Fig. 20CC). The fifth or centrally located hole actually served as an index to guide the cutting tool during the production of bone blanks. At least two sizes of variety 1 buttons are evident: a .485-inch diameter button, and a .7-inch diameter button.

Variety 2 (2)

Two buttons are flat, circular bone disks with countersunk faces like variety 1 buttons. Both variety 2 specimens, however, exhibit only four sew-through holes. These buttons are both .65 inch in diameter.

Variety 3 (14)

Most formally identifiable bone buttons (74%) are similar in shape. Variety 3 buttons display a convex back or bottom and a flat, countersunk face that contains four sew-through holes (Fig. 20DD). A small, centrally located boss--evident on many variety 3 buttons--may have been the index for cutting the bone blanks. These buttons are similar to South's type 20, found in an 1800-1830 context at Brunswick and in an 1837-1865 context at Fort Fisher (South 1974). The Fort Smith specimens range from .64-.725 inches in diameter and average diameter is .647 inch.

Military Buttons

Military uniform buttons are manufactured from brass or yellowmetal and pewter or white-metal. Formally, four different types of buttons exist. These include a cast button with integral shank (IA); a struck or stamped button with eye brazed to the back (IB); a two piece button with shell crimped over the back (II); and a three piece button with the shell and back held together by an edge moulding (III). The type III button was worn only by staff officers (Albert 1976). Although variation in size is common, generally, two sizes of military buttons occur: coat and overcoat buttons about .9 inch in diameter and smaller cuff, vest, and jacket buttons about .59 inch in diameter. Fifty-four uniform buttons from Fort Smith represent seven branches of service: general service, artillery, infantry, ordnance, dragoon, rifle, and hospital (Table 15). These are described below.

General Service

General service buttons are those buttons without regimental numbers worn by unassigned personnel of all branches of service. Over half of all uniform buttons recovered at Fort Smith (58%) are general service buttons.

Variety 1 (28)

The most commonly represented general service button is a compound, two-piece yellow-metal button (type II) with the 1855-1884 pattern line eagle device on the shell (Fig. 20Y). Normally, the eagle faces right toward the talon that clutches an olive branch with seven leaves. In the left talon, the bird holds five arrows. A barred shield covers the breast of the eagle. Variation, because of different button manufacturers, occurs in the sample. One button exhibits a blank shield. Nineteen variety 1 buttons are backmarked and include

"W.LANG/BOSTON" (1850S), "•EVANS & HASSALL" (1860-1868), "WATERBURY BUTTON CO.••" (1849+), "HORSTMAN & ALLIEN/N.Y." (1852-1877), and "SCOVILLE MFG. CO/WATERBURY" (1850-1865) marks (Albert 1976:464-465). Two other marks that include the word "EXTRA" probably date to the 1860s (Brinkerhoff 1972:5). These are "•••EXTRA•••/QUALITY," and "SCOVILLS & CO./EXTRA." Two button sizes are represented. Twenty five measurable variety 1 buttons include 17 cuff/vest buttons that range from .57-.61 inch in diameter and eight coat/overcoat buttons that range from .755-.824 inch in diameter.

Variety 2 (1)

An older line eagle device of the 1830s and 1840s also occurs on a composite yellowmetal button but one with a flatter surface. The shell exhibits an eagle with side shield on a lined background (Brinkerhoff 1972:3). The single variety 2 button from Fort Smith is a cuff or vest button without backmark.

Variety 3 (2)

Two composite yellowmetal buttons are cuff buttons from the uniform "great coat" of the 1820-1839+ period (Albert 1976:34-35). The relatively flat surface of the button contains centrally placed block "U.S." letters. The upper field is adorned with a flying eagle with olive branch in right talon and a three arrow cluster in left talon. The lower field contains an oval laurel wreath. Both of the Fort Smith examples have been gilted and display the "UNITED STATES/•" backmark.

Artillery

Three buttons from Fort Smith represent two varieties of artillery button.

Variety 1 (1). One struck, yellowmetal coat button with brazed eye reflects the 1813-1814 pattern device for the artillery service. This consists of a foliated

TABLE 15

Uniform Buttons

OBS.	SERVICE	STYLE	STYLE DATE	BACKMARK	MFG. DATE	COMP.	FORM	DIA (in)
1	ARTILLERY	VAR 1	1813-14	UNMARKED	N/A	YM	IB	.790
2	ARTILLERY	VAR 2	1855-84	"SCOVILLS./WATERBURY"	1850-65	YM	II	.590
3	ARTILLERY	VAR 2	1855-84	UNKNOWN	UNKNOWN	YM	II	.508
4	DRAGOON	VAR 1	1833-61	UNMARKED	N/A	WM	1A	.628
5	DRAGOON	VAR 2	1855-61	ILLEGIBLE	UNKNOWN	YM	II	.555
6	GENERAL	VAR 1	1855-84	"EVANS & HASSALL/•"	1860-68	YM	II	.770
7	GENERAL	VAR 1	1855-84	"EXTRA•••/QUALITY•••"	1860S	YM	II	.755
8	GENERAL	VAR 1	1855-84	"EXTRA•••/QUALITY•••"	1860S	YM	II	.755
9	GENERAL	VAR 1	1855-84	"EXTRA•••/QUALITY•••"	1860S	YM	II	.777
10	GENERAL	VAR 1	1855-84	"EXTRA/QUALITY."	1860S	YM	II	.575
11	GENERAL	VAR 1	1855-84	"HORSTMAN & ALLIEN/N.Y."	1852-77	YM	II	.610
12	GENERAL	VAR 1	1855-84	"HORSTMAN & ALLIEN/N.Y."	1852-77	YM	II	.824
13	GENERAL	VAR 1	1855-84	"SCOVILL MFG. CO./WATERBURY."	1850-65	YM	II	.815
14	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA"	1840-50	YM	II	.577
15	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.578
16	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.576
17	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.579
18	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.585
19	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.580
20	GENERAL	VAR 1	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.592
21	GENERAL	VAR 1	1855-84	"W.LANG/BOSTON."	1850S	YM	II	.570
22	GENERAL	VAR 1	1855-84	"W.LANG/BOSTON."	1850S	YM	II	.604
23	GENERAL	VAR 1	1855-84	"W.LANG/BOSTON."	1850S	YM	II	.560
24	GENERAL	VAR 1	1855-84	"WATERBURY BUTTON CO.•••"	1849-	YM	II	.775
25	GENERAL	VAR 1	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.585
26	GENERAL	VAR 1	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.583
27	GENERAL	VAR 1	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.590
28	GENERAL	VAR 1	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.580
29	GENERAL	VAR 1	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.765
30	GENERAL	VAR 1	1855-84	UNMARKED	N/A	YM	II	----
31	GENERAL	VAR 1	1855-84	UNMARKED	N/A	YM	II	----
32	GENERAL	VAR 1	1855-84	UNMARKED	N/A	YM	II	----
33	GENERAL	VAR 1	1855-84	UNMARKED	N/A	YM	II	.585
34	GENERAL	VAR 2	1830-40	UNMARKED	N/A	YM	II	.535
35	GENERAL	VAR 3	1820-39	"UNITED STATES/•"	UNKNOWN	YM	II	.585

TABLE 15 (Cont'd)

Uniform Buttons

OBS.	SERVICE	STYLE	STYLE DATE	BACKMARK	MFG. DATE	COMP.	FORM	DIA (in)
36	GENERAL	VAR 3	1820-39	"UNITED STATES/•"	UNKNOWN	YM	II	.585
37	HOSPITAL	VAR 1	1864-	UNKNOWN	UNKNOWN	YM	II	.660
38	INFANTRY	VAR 1	1812-17	UNMARKED	N/A	WM	IA	.572
39	INFANTRY	VAR 2	1855-84	"SCOVILL CO./WATERBURY."	1850-65	YM	II	.640
40	INFANTRY	VAR 2	1855-84	"SCOVILLS & CO./EXTRA."	1840-50	YM	II	.590
41	INFANTRY	VAR 2	1855-84	"SCOVILLS./WATERBURY."	1850-65	YM	II	.782
42	INFANTRY	VAR 2	1855-84	"W.H. HORSTMAN & SONS./PHI."	1843-59	YM	II	.770
43	INFANTRY	VAR 2	1855-84	ILLEGIBLE	UNKNOWN	YM	II	.595
44	INFANTRY	VAR 2	1855-84	UNKNOWN	UNKNOWN	YM	II	.632
45	ORDNANCE	VAR 1	1836-51	"SCOVILLE/WATERBURY"	1850-65	YM	III	.590
46	RIFLE	VAR 1	1816-21	UNMARKED	N/A	YM	IB	.570
47	STAFF	VAR 1	UNKNOWN	UNKNOWN	UNKNOWN	YM	III	.675
48	UNKNOWN	VAR 1	UNKNOWN	ILLEGIBLE	UNKNOWN	YM	II	.625
49	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.670
50	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.825
51	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.800
52	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.800
53	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.625
54	UNKNOWN	VAR 2	UNKNOWN	UNMARKED	N/A	WM	IA	.800

script "A" over a number "1" in oval to denote the first artillery regiment (Albert 1976:51-52). This is a common button at the nearby first Fort Smith, established in 1817 (Dollar 1966).

Variety 2 (2)

Two composite, two-piece, yellowmetal buttons exhibit the 1855-1884 pattern line eagle device with "A" in shield to denote the Artillery service. One is backmarked with the "SCOVILLS./WATERBURY." mark of the 1850-1865 period (Albert 1976:464). Thus, the manufacture date of this button may be restricted to the 10 year interval from 1855-1865. A second variety 2 button is unusual and is the only uniform button in the sample with a pressed steel back and a left-facing eagle. Both variety 2 artillery buttons are small size cuff or vest buttons.

Infantry

Seven buttons in the collection represent two varieties of infantry buttons.

Variety 1 (1)

A single, cast whitemetal cuff or vest button with integral eye is a flat surface specimen embellished with a foliated script "I" above an empty oval. This type of infantry button, manufactured from 1812-1815 (Albert 1976:22-23), is common at the nearby first Fort Smith (Dollar 1966).

Variety 2 (6)

Six two-piece yellowmetal buttons display the line eagle device of the 1855-1884 pattern with a block "I" in the shield to denote the infantry service. Four specimens are backmarked and include: "W.H. HORSTMANN & SONS./PHI." (1843-1844), "SCOVILLS./WATERBURY" (1850-1865), and "SCOVILL CO./WATERBURY" (1850-1865) (Albert 1976:464-465). One backmark, "SCOVILLS & CO./EXTRA" may date to the 1860s (Brinkerhoff 1972:3). The ranges of two datable backmarks can be refined to 1855-1863 and 1855-1865. Variety 2 buttons range in diameter from .59 and .782 inch and probably include four cuff/vest buttons and two coat buttons.

Hospital

Variety 1 (1)

One possible Hospital Corp button is represented by the yellowmetal shell of a type II button (Fig. 20X). The .66-inch diameter button has a flat surface with an elaborate stamped and enameled design. A four-arm Geneva cross occupies the center of the button and is encircled by a gadrooned border or band of repeating ridges. The intervening field is enameled to create a white background. Although traces of the pigment are no longer evident, the cross was probably tinted red. In 1864, the Geneva cross on a field of white was officially adopted as the international emblem of the Red Cross (Brown 1962:52, 68). Exactly when the military first used the emblem is uncertain but by 1889, the Geneva cross was officially used to denote members of the hospital corps. Metallic emblems and forage cap side buttons similar to the Fort Smith example are described in specifications of 1889 (USG 1986:347, 352).

Ordnance

Variety 1 (1)

A single three-piece yellowmetal staff button exhibits the shell over crossed canon device of the Ordnance Department (Fig. 20Z). The emblem is displayed on a lined backfield and is typical of the 1836-1851 period (Albert 1976:71-72). The backmark of "SCOVILLE/WATERBURY" was used from 1850-1865 (Albert 1976:464). Therefore, the manufacture range of this button can be restricted to the two year period from 1850-1851. A .59 inch diameter indicates that this specimen is a cuff or vest button.

Dragoon

Variety 1 (1). A single cast whitemetal button with integral eye bears the line eagle device with "D" in shield to denote dragoon. These buttons were used from 1833-1861, when the last dragoon regiment was converted to cavalry (Albert 1976:66). The .628-inch diameter button may have been used on a sleeve, vest, or jacket.

Variety 2 (1)

One composite, two-piece yellowmetal cuff/vest button exhibits the 1855 line eagle device with block letter "D" in the shield to denote the dragoon service. The last dragoon regiment was converted to cavalry in 1861, and so this specimen was probably manufactured in the seven year period from 1855-1861. The button is backmarked but is illegible.

Rifle

Variety 1 (1)

A single cuff or vest button, struck from brass, has a brazed eye on the reverse side. The face of the button is embellished with a centrally-located hunting horn that encircles the word "RIFLE." The upper field contains two rows of five-pointed stars, comprising a total of 15 stars. This rifle regiment button dates to the 1816-1821 period (Albert 1976:75) and is common at the nearby first Fort Smith (Dollar 1966).

Unidentified General Staff

Variety 1 (1)

One defaced button with an indeterminate device is a three piece yellowmetal button adopted for general staff officers in the 1830s (Albert 1976). A .675 inch diameter indicates function as a vest or cuff button. The button back is not present.

Unidentified Uniform Buttons

Variety 1 (1)

One unidentifiable yellowmetal button of composite, two-piece construction is represented by a button back. A maker's mark is present but is illegible. A diameter of .625 inch indicates that this is probably a cuff or vest button.

Variety 2 (6)

Six buttons in the collection are cast whitemetal buttons with integral loops. Pewter and pewter alloys do not preserve well under local site conditions and all examples are severely pitted. Four variety 2 buttons do exhibit some form of eagle device but can not be assigned to specific services. These range from .625-.825 inches in diameter. Two specimens are cuff or vest sized buttons and four others are coat or overcoat buttons.

Fatigue Buttons (35)

Thirty-five fatigue or undress uniform buttons occur at Fort Smith (Fig. 20AA-BB, Table MF.36)). These are identical to Olsen's type K button used by all branches of sevice--primarily on trousers--from 1812 through the 1860s (Olsen 1963:552). South identified fatigue buttons in an 1837-1865 context at Fort Fisher (South 1974). The buttons from Fort Smith are cast, circular, four-hole sew-through whitemetal buttons. The obverse surface of the button is smooth and slightly concave. The reverse surface, however, is flat and exhibits two mold seams. One seam encircles the button and another bisects it from edge to edge. A projection in the center of the button marks the point where the sprue was cut away from the mold. Two button sizes are evident: a large .7-inch diameter button (n=30) and a smaller .55-.565-inch diameter button (n=5).

Military Accouterments

Sixteen artifacts are items of military issue and have been included in the accouterments artifact class (Table MF.33). Accouterments are defined by regulation as "equipment habitually carried by a soldier on his person in distinction to his arms and clothing" (Todd 1980:185). Accouterments would include containers, hangers, belts, and straps. Accouterments are further interpreted here to include objects attached to clothing, excluding buttons, such as insignia, shoulder scales, regimental numbers, etc.

1858 Pattern Infantry Insignia (1)

The 1858 pattern infantry insignia, adopted for enlisted men and officers of the infantry, is a hunting horn of stamped brass. Originally, the emblem was to be used in conjunction with a one-inch company letter and a 5/8 inch regimental number on the Jeff Davis-style hat. A smaller version was issued during the Civil War for the forage cap. The insignia remained in use until 1875 (Brinkerhoff 1972:9; Howell 1975:5-6). The incomplete specimen recovered at Fort Smith is the large sized insignia for the Jeff Davis hat. The loop for a company letter is one inch in diameter. The emblem is 1.55 inch high and over 2.85 inches wide (Fig 21K).

1854 Pattern Shoulder Scale (1)

Beginning in 1854, brass shoulder scales were issued to enlisted personnel of all branches (Brinkerhoff 1972:31-33). The shoulder scale is composed of two parts: a strap and crescent. The strap or narrow part of the scale is made of overlapping sections of sheet brass supported by a thin brass edge-moulding and a tin back. The crescent, on the distal end of the strap, is a wide, stamped brass-oval device. The most proximal section of the strap contains a T-slot for mounting the device to the shoulder. A rotating wing stud sewn on a garment near the collar inserts through the T-slot and is locked in place.

The specimen from Fort Smith is the proximal section or strap of an 1854 pattern shoulder scale (Fig. 21C). A portion of the edge moulding that surrounds the strap is intact and corrosion from the former tin back is evident. The scale is stamped from .9 mm-thick sheet brass and measures 1.3 inches long by 2.2 inches wide. The T-slot is .58 inch wide and .6 inch long.

1858 Pattern Forage Cap Slide (2)

Two 1858 pattern forage cap slides were recovered (Fig. 21F). The earliest detailed specifications for the forage cap, from 1865, state that the cap shall have "a chin strap 5/8 inches wide...and...a slide, of No. 19 sheet brass, 7/8 of an inch long and 3/4 of an inch wide, made with a bar in the centre over which the strap passes..." (Howell and Kloster 1969:59). The cap slides from Fort Smith are stamped from .01-inch thick sheet brass and have rounded corners and a stationary center bar. The slides measure .945 inch long by .8 inch wide--similar to the specified dimensions. An interior width of .646 inch could have contained a 5/8-inch wide strap. The 1858 pattern forage cap was extensively used through the civil war and was not replaced until after 1872, when new uniform regulations were published (Chappell 1972:13-14).

1839 Pattern U.S. Belt Plate (1)

The 1839 pattern U.S. belt plate is a stamped sheet brass-oval buckle with block "US" letters emblazoned on the front. The hollow back of the plate is solder filled. Originally, two sizes of belt plate were specified: a 2.2x3.5 inch buckle and a 1.6x2.8 inch buckle (Todd 1980:79). Until 1861, the large buckle was usually worn by enlisted men on sabre belts and from 1840-1870s, on a cartridge box flap. The small buckle was worn on waist belts by the infantry from 1839, until they were eliminated by the ordnance regulations of 1861

(Brinkerhoff 1972:20).

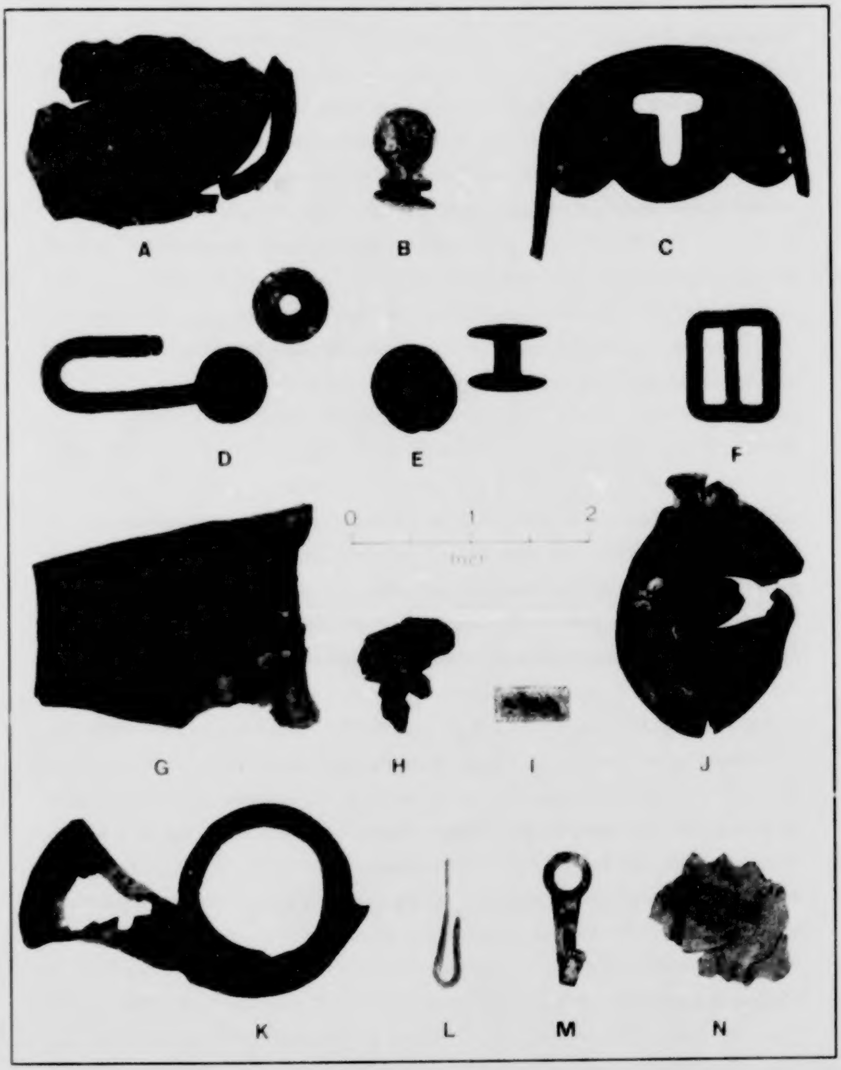
A fragmented U.S. belt plate recovered at Fort Smith contains nearly all of the letter "S" (Fig. 21A). Although the object is too small to be measured, the size of the surviving letter indicates that this is the larger 2.2x3.5 inch buckle. Although remnants of solder stain the hollow depression in the back of the plate, there is no evidence of belt loops or prongs. The Fort Smith specimen could have been used on either a sabre belt or cartridge box.

Braid (1)

A segment of knotted braid recovered at Fort Smith may represent an aiguillette (Fig. 21H). A large .372-inch diameter knot, preserved by copper salts, covers a twisted copper chain of three or more links. Two links are attached to smaller .22-inch diameter knots that represent points of attachment for cords or braids. The fabric is composed of three left twisted strands that incorporate gold-colored filaments. A right twist combines these strands to form a cord about .15 inch in diameter. The fabric is stained from reaction with the copper chain, however, and its original color may not be determined.

The knotted cord from Fort Smith could have come from different braided accouterments such as overcoat frogs, hat cords, or aguillettes. The latter object is the best candidate. The aiguillette is an ornamental tagged or pointed-end cord of twisted gold or gold and silver fibers worn suspended from the right shoulder under the epaullette. Before 1851, the aiguillette was worn by certain staff officers and aides-de-camp in full dress. During the Civil War, a red aiguillette was worn as part of the dress uniform of the light artilleryman (Lord 1982:12; Todd 1980:105). An illustrated example (Lord 1982:12) indicates that an aiguillette is basically a knotted loop with two pointed cords--the same configuration indicated by the braid described here.

Figure 21. Military Accouterments. A) 1839 pattern U.S. belt plate; B) Cartridge box button; C) 1854 pattern shoulder scale; D) Knapsack hook; E) Sabre belt stud; F) 1858 pattern forage cap slide; G) Bayonet scabbard ferrule; H) Braid; I) Captain/First Lieutenant bar; J) 1851 pattern ordnance insignia; K) 1858 pattern infantry insignia; L-M) Strap adjustment hooks; N) 1851 pattern general service insignia.


A
B
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Sabre Belt Stud (2)

Two sabre belt studs were recovered (Fig. 21E). These are removable rivets placed through slits in the sabre belt and associated straps to adjust the length and angle of the scabbard. The 1841 ordnance manual reveals that four "studs" accompany every sabre belt but provides no dimensions (Jacobsen 1968:136). The Fort Smith specimens are identical cast brass objects. Unlike other types of rivets, the components of the brass stud are integral. The only distinguishing feature between the head and bur is that the surface of the head is slightly convex while the surface of the bur is flat. Diameter of both head and bur is .65 inch and overall length of the stud is .55 inch.

Belt Hook (2)

The pedestrian trail excavation produced two strap adjustment or belt hooks (Fig. 21L-M). The first is a regulation hook for the sabre belt and associated shoulder straps as described in the ordnance manuals of 1839, 1841, 1850, and 1861 (Jacobsen 1968). The brass hook tapers gradually to a recurved distal end. At the proximal end (broken), one of two perforations for mounting the hook to a belt or strap is evident. The hook is .07 inch thick, .22 inch wide at the widest point, and over 1.1 inches long. The second hook is not described in official specifications and may be a nonregulation item. Stamped from .03-inch thick sheet brass, this hook displays a flat cross-section. The round proximal end contains a single, .2-inch diameter eye for mounting to a belt or strap. The hook tapers gradually to the distal end which has a rounded point. Maximum width of this specimen, at the eye, is .415 inch and length of the hook is 1.12 inches.

Knapsack Hook (2)

Two knapsack strap-adjustment hooks are present (Fig. 21D). One complete hook is constructed of heavy-gauge brass wire, .172 inch in diameter. At the distal end the wire is bent to form a 1.05-inch long hook. The proximal end of the object is bent at a 45 degree angle and topped with a cupped washer, .62 inch in diameter. The second hook is represented only by a .635-inch diameter, cupped brass washer. Knapsack hooks identical to the Fort Smith specimens are depicted by Lord (1982:148) and Todd (1980:205-210) and were used on knapsacks of the Civil War period.

1851 Pattern Ordnance Insignia (1)

The shell and flame device, associated with the Ordnance Department since 1833, was adopted as the exclusive departmental insignia in 1851 (Todd 1980:88). The 1851 pattern ordnance device was worn as a hat insignia on the service shako or the Jeff Davis hat by all enlisted personnel of the Ordnance Department. The Fort Smith specimen is damaged and the flames have been removed from the shell (Fig. 21J). The spherical shell is approximately 1.75 inch in diameter. A small protrusion at the top of the shell, where flames once appeared, is .75 inch wide and .25 inch high. Solder stains are evident on the reverse surface of the object.

1851 Pattern General Service Insignia (1)

The general service insignia of 1851, incorporates the "Arms of the United States." Struck from sheet brass, the insignia bears an eagle with upraised wings; an olive branch in right talon; and a scroll with national motto clenched in beak. Sunrays, stars, and clouds are suspended above the eagle. The general service insignia, a hat emblem, was worn at the base of the pompon by all enlisted personnel. The device was used for 21 years--on the service shako or Albert hat of 1851-1858, and on the Jeff Davis hat of 1855-1872 (Campbell and Howell 1963:28; Howell and Kloster 1969:67; Brinkerhoff 1972:14). The specimen from Fort Smith is badly damaged and measurement is not possible (Fig. 21H).

Cartridge Box Buttons (2)

The pedestrian trail excavation produced two cartridge box buttons (Fig. 21B). Officially described in 1850, these "brass buttons" (Steffen 1978:140) were riveted to a cartridge box to engage the outer flap or cover (Todd 1980:200). Cap pouches and leather holsters depicted by Lord (1982:123) use a similar type of fastener. Both Fort Smith examples, of cast brass, are round balls with flanged bases, rivet stems, and brass burs. Two different sizes are evident. The first is a .512-inch diameter button with a smaller .44-inch diameter flanged base, and a .275-inch diameter rivet stem. A .52-inch diameter bur fastened the button to a leather cartridge box. The distance between the flange and bur of the button indicates that the cartridge box leather was .11 inch thick. After being riveted in place, length of the exposed button, from flange-to-head, was .675 inch. Overall length of the object is .85 inch. A second, smaller button exhibits a .515-inch diameter head with a .51-inch diameter flanged base. A .275-inch diameter stem holds a .475-inch diameter bur. Length from flange-to-bur indicates a cartridge box leather thickness of .075 inch. Length of the exposed button is .57 inch while overall length, including head and rivet stem, is .71 inch.

Captain/First Lieutenant Bar (1)

One stamped sheet brass ornament (Fig. 21I) is a shoulder strap rank device identical to that described by Todd (1980:98, 103). The rectangular bar measures .32x.65 inch. Raised lines that create the impression of braid, cross the surface of the bar. A solder stain is evident in the hollow back of the emblem and indicates that it had been filled. Rank devices such as this one were worn on shoulder straps--two bars to signify the rank of captain and one bar for first lieutenant. The bar from Fort Smith was probably once silver plated since the device is officially described as a "silver bar" (Todd 1980:103).

Knife/Bayonet Scabbard Ferrule (1)

One knife/bayonet scabbard component has been tentatively placed in accouterments (Fig. 21G). The 1840 ordnance manual refers to the object as a "ferrule" (Jacobsen 1968:202). The Fort Smith specimen is constructed of sheet brass and as the most proximal ferrule on the scabbard, has a rolled edge or rim for reinforcement. The ferrule is 2.0 inches wide and 2.35 inches long. Similar components were incorporated in the model 1840 bayonet scabbard (Jacobsen 1968:202). Civilian sheath knives of the period also employed metal reinforced scabbards (Peterson 1977). The dimensions of the Fort Smith specimen, however, probably indicate a bayonet.

PERSONAL GROUP ARTIFACTS

Sixty seven objects are placed within the personal group (Table MF.37). These personal possessions include jewelry, hair ornaments, toys, false tooth, pocket knives, pocket watch, coins, and straight razors.

Jewelry

Cuff Button (1)

One cuff button recovered at Fort Smith is a .8x.8-inch square brass button with a gold electroplated finish (Fig. 22P). A repousse' border design composed of a beaded line that encircles a gadrooned or repeating flute motif surrounds a .368-inch square set. The set is "goldstone" or aventurine, first manufactured ca. 1840, the same year that electroplating was patented (Kovel and Kovel 1967:164, 237). Goldstone is glass flecked with copper filings or bits of chromic oxide. The back of the cuff button is stamped "PT DEC 8/88" and, therefore, the object post-dates the military occupation at Fort Smith.

Finger Ring (1)

One brass finger ring in the collection is hand made with an irregularly filed but well worn surface. The .61 inch interior diameter of the ring is approximately size 5 (Fig. 22H).

Earring (1)

A fragment of a composite two-piece earring was recovered (Fig. 22R). The earring consists of two moon-shaped crescents hinged together by a copper pin. A movable wire loop once attached to the pin and fastened or locked on the opposite end of the crescent. The earring was worn with the loop inserted through the earlobe. The brass earring was finished with an electroplated gold surface. Identical earrings called "gold drops" are illustrated in the 1886 Bloomingdale Brothers catalogue (1988) and in the Montgomery Ward catalogue (1895:179).

Locket Frame (1)

One .05-inch diameter wire filament in the collection exhibits one half of a hinge and so was classified as a locket frame (Fig. 22O). The .95-inch long wire is twisted, however, and original locket shape may not be determined. The cuprous base metal of the piece was finished in gold electroplate, a process patented in 1840 (Kovel and Kovel 1967:164).

Bracelet (1)

The clasp from a chain bracelet is a 1.0-inch diameter medallion stamped from .01-inch thick sheet brass (Fig. 22O). Integral square tabs project from opposite sides of the medallion. Two brass loops are soldered to each tab and served as points of attachment for a bracelet chain. A simple, unwelded jack chain link of the same metal is attached to one loop.

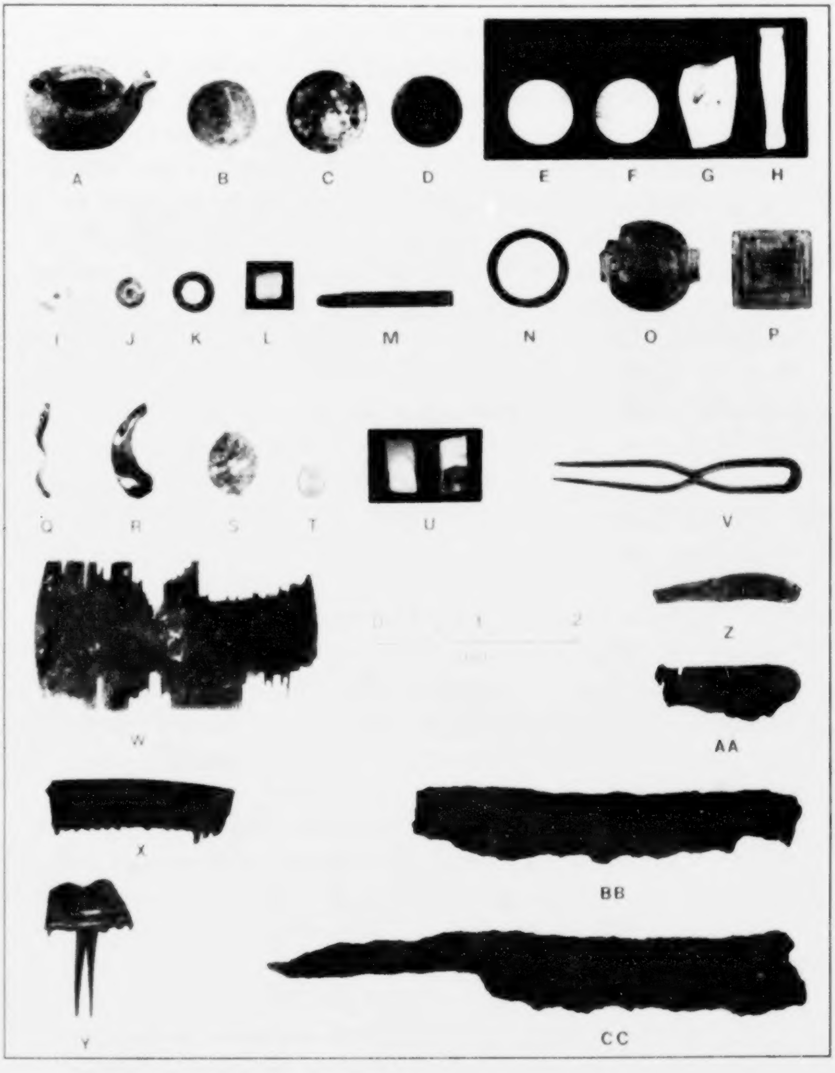
Sets and Mountings (4)

Four artifacts represent sets or mountings from unidentified pieces of jewelry. Two sets without mountings are circular, red glass jewels with flat bases and convex surfaces. Slight lips or rims encircle the jewel bases to serve as points of contact for mounting. The first set is .46 inch in diameter and .267 inch thick, and the second smaller set is .385 inch in diameter and .236 inch thick. One mounting of stamped sheet brass has no set. It is an oval rosette, .4x.3 inch, with a gadrooned border surrounding a .18-inch circular depression for the set. Another set with mounting consists of an oval, faceted, pink glass jewel encased in a stamped, sheet brass mounting (Fig. 22T). The mounting, finished with silver electroplate, is crimped around the jewel base. Eight prongs adorn the mounting but do not actually support the set. The object measures .35x.3 inch and is .15 inch thick.

Beads (12)

Twelve beads recovered at Fort Smith represent a variety of types (Fig 22I-M). These are described using the descriptive terminology of Van der Sleen (1966). Seven specimens are spirally wound beads. Six of these are globular shaped and the seventh is an unusual annular shaped bead. All of the wound examples are blue with the exception of one white specimen. Four other beads are drawn and cut. One is an opaque colored, cornerless sectagonal prism. Three others are globular shaped milk glass beads. Their shape may have been achieved by rolling and polishing. The last bead is an unusual black colored, 1.36-inch long bead that is shaped like a sectagonal prism.

Figure 22. Personal Objects. A) Miniature pewter tea kettle. B) Stone marble. C) Bennington marble. D) Agate Marble. E) Plain bisque marble. F) Bisque marble with hand painted lines. G) Doll leg. H) Doll arm with tie-in groove. I-J) Spirally wound globular beads. K) Spirally wound annular bead. L) Drawn, cornerless sectagonal prism bead. M) Drawn, sectagonal prism bead. N) Handmade brass finger ring. O) Bracelet clasp. P) Cuff button with aventurine set. Q) Locket frame. R) "Gold drop" earring. S) Rosary medallion. T) Faceted pink glass jewel in brass mounting. U) Porcelain false tooth. V) Crimped hard rubber hair pin. W) Two-sided fine-tooth bone dressing comb. Y) Hard rubber back or side comb. Z) Congress pen-style pocket knife. BB-CC) Iron straight razor blades.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Rosary Medallion (1)

One oval-shaped rosary medallion, .62x.52 inch, is stamped from .035-inch thick sheet brass (Fig. 22S). Perforated tabs are evident on the long axis at opposite ends of the medallion. On the obverse face, a gadrooned border incloses a standing robed figure and the following inscription which may read: "OMARE CONCUESANS PEGHE PRIEZ ECUANOU." The inscription appears to be antiquated French and may be translated thusly: "conquering all things through the prayer of equanimity." The medallion is in poor condition and the inscription may not be accurately transcribed. The reverse face depicts an altar and cross surrounded by twelve five-pointed stars and a gadrooned border.

Hair Ornaments/Combs (16)

Sixteen comb and hair ornament fragments were found that represent two dressing combs, one back or side comb, and two hair pins. The remaining eleven fragments are from unidentifiable combs or hair ornaments.

Two black, hard rubber hair pins are present. One is the prong from a hairpin of undetermined shape or form. The second is a complete hairpin identical to No. 20554 in the Montgomery Ward catalogue (1895:106) that is described as a "crimped rubber hairpin." Length of the complete hairpin is 2.55 inches (Fig. 22V).

A back/side comb, also black hard rubber, is represented by a portion of the comb back with intact teeth (Fig 22Y). The back exhibits a molded scallop design and the teeth are generally flat and wide. Similar examples depicted in the Montgomery Ward catalogue (1895:105-106) are described as "back combs" or "side combs."

Two different varieties of dressing combs occur in the sample. The first is the back from a single sided, black, hard rubber comb (Fig. 22X) similar to examples in contemporary catalogues (Montgomery Ward 1895:106). A second, the only bone comb in the collection, is a two-sided, fine-tooth dressing comb. This complete specimen is a thin, saw-cut comb with excurvate ends and measures 2.8x1.535 inch (Fig. 22W).

All of the combs in the Fort Smith collection are typical examples of nineteenth century combs marketed in contemporary catalogues. The majority of these with their wide teeth and ornate molded designs are probably female specific. All of the 16 comb/hair ornament fragments but one are molded from black, hard rubber. Vulcanization, the process of producing hard rubber, was patented by Charles Goodyear Jr. in 1851 (Herskovitz 1978:132), and so the combs post-date this technological development. Only one comb is manufactured from bone.

Toys

Seven marbles, 10 doll fragments, and a miniature tea kettle recovered during the investigation are toys and indicate the presence of children on the post.

Marbles (7)

Seven marbles from Fort Smith represent as many varieties but were manufactured in four materials: glass, clay, bisque, and agate (Fig. 22B-F). The single glass marble is a venetian-type marble of clear glass with a blue and yellow swirled ribbon core. One clay marble is plain and the second is finished with a mottled green and brown Bennington-like glaze. One bisque marble is plain while another is encircled with hand painted lines--seven black lines and six red lines cross in opposing directions. The two natural agate marbles are brown to reddish-brown and range from poorly polished to highly polished.

Dolls (10)

Ten fragments of ceramic dolls were recovered (Fig. 22G-H). Two are bisque and eight are porcelain. Four fragments are doll heads of hollow-cast construction that exhibit long curls. Two of the head sections are tinted with an overglaze black enamel. Four doll fragments are sections of legs--three are solid-cast legs with bulbous, stylized calves and the fourth, of hollow-cast construction, has a tie-on groove for use with a cloth body. One doll arm and a stylized doll hand are solid cast. The arm has a tie-on groove above the elbow.

Porcelain dolls were rarely known before 1860, and most of the nineteenth century examples are cast or press molded (Noel Hume 1980:317-318). Doll heads with long curls, however, may date as early as 1840 (Kovel and Kovel 1967:299), while stylized elements like the bulbous calf leg may reflect a post-1880 manufacture date (Noel Hume 1980:318).

Miniature Tea Kettle (1)

Children's pewter tea sets were common nineteenth century toys. A miniature pewter tea kettle recovered at Fort Smith is a round, 1.25-inch diameter container with flat bottom, .72-inch high vertical sides, and a constricted .58-inch diameter orifice. A pouring spout protrudes from one side of the kettle and evidence of a loop bail or handle exists on opposite sides of the orifice (Fig. 22A).

False Tooth (1)

A porcelain tooth that represents a right upper incisor, occurs in the collection (Fig. 22U). It is a realistically crafted false tooth that has enamel and gum sections separated by a gumline. The tooth is hand painted in three colors: a white enamel tooth with a hint of yellow plaque below the gumline, and a flesh colored gum. The back of the tooth has been ground for a personalized fit and also exhibits evidence of the setting. A silver plate or back adheres to the incisor, pegged onto the porelain with a silver wire. Thus, the tooth is probably part of a bridge to replace a missing incisor. The false tooth is .55 inch long, .275 inch wide, and .185 inch thick.

Pocket Knife (3)

Three pocket knives are represented in the Fort Smith collection. The first is a bolster and bolster lining of cuprous base metal. A rivet of the same composition protrudes through the bolster lining and once secured a slat handle. Formally, the specimen is a "cattle knife" (Peterson 1977:138) with a straight handle and rounded ends or bolsters (Fig. 22AA). Width of the knife is .465 inch and partial length is 1.5 inch. A second pocket knife is a "congress pen" style knife (Peterson 1977:138) with rounded ends or bolsters, and a diminutive, curved handle (Fig. 22Z). This specimen is represented by two partial brass bolster lining plates held together by a rivet of the same composition. The knife is .265 inch wide and exhibits a partial length of 1.45 inches. A third pocket knife is represented by a brass bolster attached to an iron bolster lining. Like observation 1, this specimen is also a cattle knife with straight handle and rounded ends. The knife is .45 inch wide and over 1.3 inch long.

Pocket Watch (1)

One watch fragment discovered at Fort Smith is from a pocket watch gear plate. Made of a ferrous base metal with a gold electroplated finish, the gear plate exhibits three pivot holes for pinions or balancing wheels. Projected diameter of the gear plate is 1.75 inch and suggests a pocket watch.

Coins (3)

The pedestrian trail excavation produced three coins. One seated liberty dime with New Orleans mint mark bears an 1838 date. A second coin of the same type and denomination but without a mint mark was struck in 1841. The third coin is a seated liberty half dime with a New Orleans mint mark and 1844 date.

Straight Razors (2)

Two iron straight razor blades were recovered (Fig. 22BB-CC). The first is a 3.75-inch long, .73-inch wide blade. At the back, the blade is .2 inch thick and enough of the razor is intact to determine that the back is slightly curved. The faces of the blade exhibit a full-hollow grind. The second razor blade is complete. It has a .22-inch thick, curved back. The tang recurves to form a depression or finger hold. The tip or distal end of the blade is notched or indented. Faces of the blade are hollow ground. Overall length of this razor is 5.25 inches and width is .8 inch.

Both razors are similar to examples in the Sears Roebuck catalogue (1902:496) and apparently represent a common razor form. The nearly 3/4-inch wide blades of the Fort Smith specimens, according to a manufacturer, are intended to "fit the coarse heavy beard" (Sears and Roebuck 1902:496).

TOBACCO PIPE GROUP ARTIFACTS

Fifty six objects associated with tobacco consumption are placed within tobacco pipe group artifacts. These include clay pipes and snuff jars.

Clay Pipes (51)

Fifty-one pipe fragments recovered at Fort Smith are from clay pipes (Fig. 23, Table MF.38). These represent two styles: long-stem kaolin pipes (20) and short-stem elbow or reed-stem pipes (31).

Kaolin pipes in the sample are quite fragmentary. Of the 20 examples found, 15 are from pipebowls and only five are from stem sections. Because of the small sample of stems, draft hole diameters were not recorded. Ten kaolin pipe bowls exhibit some form of relief design including vertically ridged or gadrooned (3), floral (4), and anthropomorphic (2). The anthropomorphic forms, probably from the same pipe, reveal an exposed human head with wreath. Only four pipe bowl fragments are plain. Two pieces, one with a molded floral design, exhibit a yellow lead glaze. All of the kaolin pipe stems are plain with the exception of one specimen that is embossed "Peter---/---Dorn."

Clay elbow or reed-stem pipes are represented by one complete pipe, 19 bowl fragments, and 11 stem fragments. Elbow pipes are formally similar with simple cylindrical bowls that meet short, broad stems at right angles. One pipe has a spur or keel at the base of the bowl. A variety of pastes are reflected and range in color from grey-to-brown-to-red. Twenty-five examples have some form of surface treatment such as a slip, glaze, or combination of both. Three pipes have a tan to brown slip. Eleven pipes have a thin, discontinuous fly-ash glaze (eg. Thomas et al. 1972:1-31)--usually clear--without an underlying slip. An equal number of pipe fragments, however, exhibit both slips and glazes. Ten examples have a fly-ash glaze over a tan-to-brown slip while an eleventh example exhibits a clear salt glaze over a brown slipped surface. Only six sherds have neither glaze nor slip.

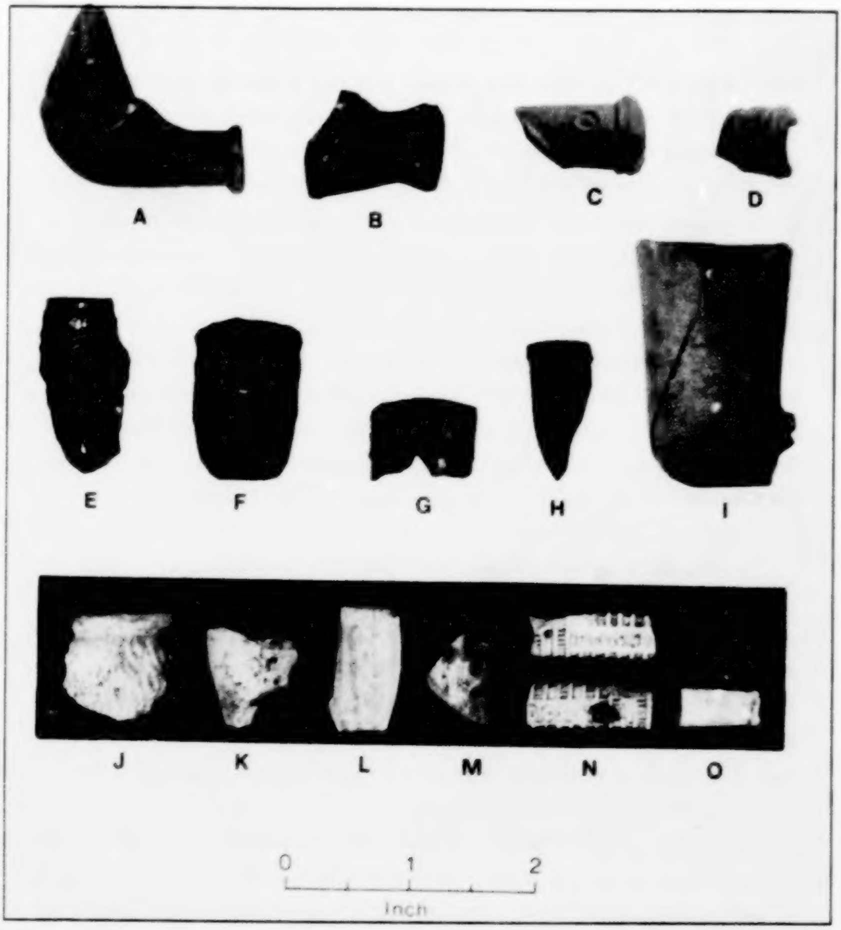


Figure 23. Tobacco Pipe Group Artifacts. A-B) Elbow pipes with raised borders on stems. C-D) Clay elbow pipe stems with bullseye motif. E) Elbow pipe with anthropomorphic design. F) Elbow pipe with chevron design. G) Elbow pipe with crosshatched design. H) Elbow pipe bowl with raised border on rim. I) Plain elbow pipe. J) Kaolin pipe with anthropomorphic bowl. K) Kaolin pipe bowl with floral design. L) Kaolin pipe bowl with vertical ridges. M) Kaolin pipe bowl with yellow lead glaze. N) Kaolin pipe stem with molded design and maker's name. O) Mouthpiece from kaolin pipe stem.

A similar diversity is evident among elbow pipe designs. Seventy one percent of all elbow pipes have some form of relief molding that includes crosshatching in parallel lines (1), the bullseye motif (4), chevrons (2), raised rims encircling bowl or stem edges (12), unknown geometric designs (2), or anthropomorphic elements (1). A single anthropomorphic pipe bowl represents a bearded head with turban. Only nine elbow pipe fragments have no form of decoration at all.

Because only clay pipes preserve under normal conditions, smoking activity at Fort Smith is probably underrepresented. Briar pipes were favored and cigars and chewing were other common methods of using tobacco. Clay pipes had reached their peak of popularity among American soldiers during the Civil War and by the 1870s, were considered low class (Clary 1985:334).

Snuff Jar (5)

Five brown glass sherds are from the lip/shoulder region of a snuff jar (Table MF.10). The container has a square body and rounded shoulders that constrict to a diminutive, single bead collar. The lip exhibits an improved tooled finish and was probably manufactured between the early 1870s and ca. 1915 (Deiss 1981:94). The snuff jar probably postdates the military occupation at Fort Smith.

ACTIVITIES GROUP ARTIFACTS

The activities group includes 1,506 artifacts. These are placed in 10 subgroups: writing equipment, construction tools, agricultural tools, Indian trade, communication, fishing, shipping container, medical/veterinary, transportation, and blacksmith/farrier artifact classes.

Writing Equipment

Writing class artifacts have been placed in the activities artifact group and, with the exception of slate pencils, are believed to reflect official military activities. Writing equipment is abundant at military posts. The frequency of ink bottles at Fort Union and Fort Laramie led one writer to quip that "the army rode on its records" (Wilson 1981:95). The Fort Smith quartermaster consistently requisitioned ink--often in pint bottles--and other items including "steel pens, quills, and lead pencils" for writing (Bento 1988:107). Fifty three writing class artifacts recovered at Fort Smith include slate pencils, mechanical pencil, ink pen barrel, ceramic and glass ink bottles, and an inkwell.

Slate Pencils (8)

Slate pencils, actually manufactured of soapstone, are for writing on slates and were used by school children during the nineteenth century. Eight slate pencils were found during the investigation that reflect a great deal of diversity (Fig. 24O, Table MF.39). Pencil cross-sections are round (5), sectagonal (2), or round with two flat sides (1). Diameters range from .14-.208 inch with the modal diameter being .2 inch. All are fragmented but each pencil exhibits intensive reuse, indicating a highly valued implement. The Russel and Erwin hardware catalogue of 1865 (APT 1980:402) describes "slate pencils" as coming in wood boxes of 100 each, and differentiates between slate and "artists and mechanics lead pencils." While slate pencils occur frequently at Fort Smith and Fort Washita (Lewis et al. 1975:57, 66, 190), they are not common at other military sites.

Mechanical Pencil (1)

One mechanical pencil nib or tip of molded brass was recovered (Figure 24N, Table MF.39). The proximal end of the nib is threaded to screw into a pencil barrel. The nib tapers gradually to a pointed distal end. A knurled bolster separates the proximal and distal sections of the tip. It acts as a stop below the screw threads and also serves as a means of unscrewing the nib from the pencil. The nib is finished in silver electroplating. Length is .63 inch and maximum diameter at the bolster is .14 inch. A mechanical pencil with identical tip is depicted as item No. 20611 in the Montgomery Ward catalogue of 1895 (Montgomery Ward 1895:185).

Fountain Pen Barrel (1)

A fragment of black-colored, hard rubber from a fountain pen barrel was recovered (Table MF.39). Projected diameter of the cylindrical barrel fragment is .45 inch. The pen barrel exterior is embossed "GOO---," and probably represents the Goodyear Company. The vulcanization process for producing hard rubber was developed by Charles Goodyear Jr., and patented in 1851 (Herskovitz 1978:132).

Ceramic Ink Bottle (40)

From ca. 1850-1890, ink was marketed in stoneware bottles (Ketchum 1983:71). Forty sherds in the Fort Smith collection are from this distinctive bottle which exhibits a grey colored paste and a rich-brown, iron oxide slip (Table MF.7). Formally, these storage bottles have flat bases, cylindrical bodies, carinated shoulders that create the appearance of a cone-shaped top, and a short vertical neck with a broad collar lip. Many lips have a pouring spout but this feature is not evident on specimens in the Fort Smith collection. All of the sherds indicate a hand thrown product. A single maker's mark, represented by an impressed cursive "W---," has not been identified to manufacturer (Fig. 11HH).

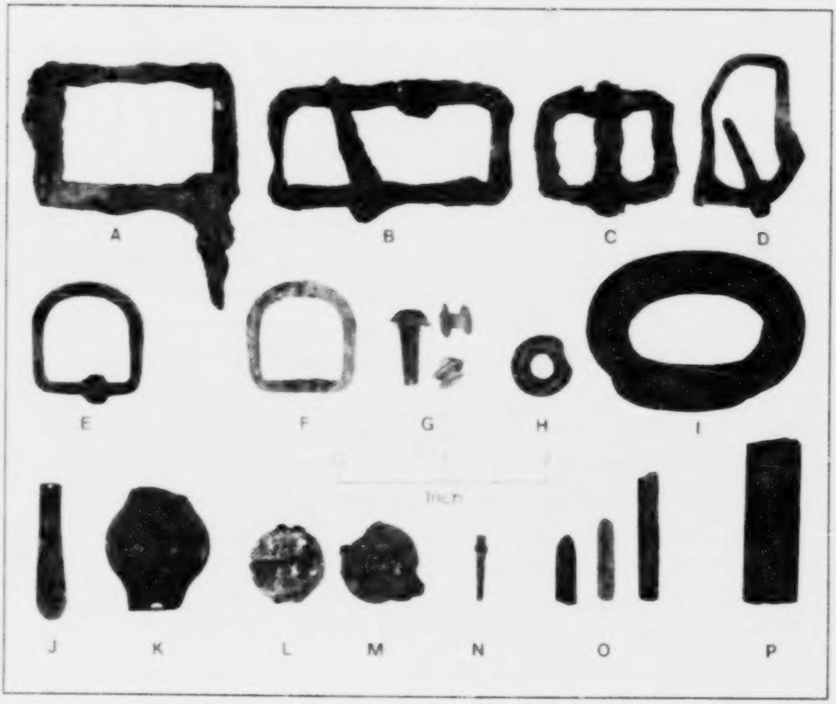


Figure 24. Selected Activities Group Artifacts. A-C) Iron harness buckles; D-F) Brass harness buckles; G) Copper harness rivets; H) Tarp/wagon cover grommet; I) Hame/Halter Eye; J) Line weight; K) Unidentified machine component; L-M) Lead bale seals; N) Mechanical pencil tip; O) Slate pencils; P) Carbon battery cell.

Glass Ink Bottle/Ink Well (3)

Two fragmentary ink bottles of clear glass are octagonal, flat panel vessels (Table MF.10). Both are widest at the base and constrict at the neck. These bottles are similar to specimens #362-363 displayed by Wilson (1981:97), that he places in the ca. 1865-1890 period. Since only base/insweep portions of the Fort Smith bottles are intact, the lip finish and manner of construction are unknown.

One ink well is represented by a thick-bodied, clear glass sherd (Table MF.10). The vertical walled container exhibits a paneled or octagonal form with an impressed star evident on at least one panel. The ink well is constructed of pressed glass.

Communication

Two carbon battery cells recovered at Fort Smith represent a function or device requiring a stored electrical charge (Fig 24P, Table MF.39). The 1895 Montgomery Ward catalogue (1895:214-215) marketed carbon batteries for electroplating and for operating telegraphs, telephones, doorbells, and other small appliances. Both excavated specimens are fragments of .572 and .515-inch diameter battery cells, and could date as early as 1858. In that year, the Missouri River and Western Telegraph Company installed a telegraph line from St. Louis to Fort Smith (Bento 1988:74).

Fishing

Line Weight (1)

One lead fishing weight is a teardrop-shaped sinker that measures 1.32 inch long and .3 inch wide at maximum diameter (Fig. 24J, Table MF.39). An iron wire runs longitudinally through the weight and probably once formed an eye or tie-on loop. The eye is not present.

Shipping Container

Bale Seals (2)

Two lead bale seals in the Fort Smith sample may reflect the use of a baling press by the Quartermaster Department (Fig. 24L-M, Table MF.40). Both seals are circular lead disks through which two .1-inch diameter, iron bale wires cross. The first seal is .724 inch in diameter and .23 inch thick. The second seal is .775 inch in diameter and .205 inch thick. Both were crimped over the intersection of baling wires with a pliar-like tool that embossed one or both faces of the seals. The first example has "415" on the surface and "155" on the reverse side. The second seal exhibits an embossed "241" on one surface only. In the 1850s, the Quartermaster Department attempted to substitute bales for wooden barrels as shipping containers. A packing press was sent to Fort Leavenworth in 1854, and one may have been shipped to Fort Smith. Such presses produced tightly packed bales wrapped in tarred paper and burlap (Risch 1962:322; Thompson 1975:29).

Barrel Hoop (112)

A total of 112 fragments of iron barrel hoop or stays was recovered (Table MF.41). Barrel hoop fragments are iron straps, often with visible rivets at overlapping strap ends. Thirty-three specimens display evidence of riveting. Barrel hoops range from .45-1.3 inch wide and display a great deal of variation that probably indicates a hand made product. Yet, a noticeable bimodality within hoop width may indicate common or popular widths of 3/4 and 1 inch.

Although many different shipping containers were used by the army, the cask or wooden barrel was most common (Risch 1962:322). Two types of wooden barrels were employed after 1850 that commonly contained food items. Barrels with iron stays for liquids or meat in a brine solution and barrels with wooden stays for dry goods (Bento 1988:54). Quartermaster requisition lists indicate that neatsfoot oil, tar, plaster, and nails were commonly shipped to the Fort Smith Depot in barrels (Bento 1988:115). As a result, the presence of barrel hoop fragments may not be a good indicator of consumable foods. Therefore, they have been placed in the shipping container class within the activity group and are expected by Bento (1988:56) to be a good indicator of quartermaster supply.

Medical/Veterinary

Twenty nine objects have been placed in medical/veterinary class artifacts. These include a tin pill box, prescription and patent medicine bottles, and glass medicine vials. The Fort Smith quartermaster requested a variety of medical and veterinary supplies, many in liquid form and some specifically described as being shipped in bottles like "castor oil, opeldeldoc, and mustang linament" (Bento 1988:111-112).

Tin Pill Box (1)

One rectangular tin container with removable lid is believed to be a pill box. The pocket size tin is 1.9 inch long, 1.48 inch wide, and .32 inch thick (Table MF.3).

Prescription Medicine Bottles (5)

Five lip/neck sherds, from as many bottles, exhibit a prescription type collar (eg. Wilson 1981:111). This is, essentially, a flanged-to-thickened lip with an inward sloping bevel to facilitate the pouring of liquids (Fig. 15K, Table MF.10). Prescription lips are not directly associated with body sherds in this sample but Wilson (1981:110) illustrates plain round and fluted round spicimens. Therefore, some cylindrical body sherds in the collection may be from prescription medicine bottles. With the exception of one aqua colored specimen, prescription medicine bottles are clear. All lips exhibit an improved tooled finish and one is ground for a stopper.

Patent Medicine (3)

Three sherds can be identified as patent medicine bottles (Table MF.10). One aqua colored, recessed panel body sherd is embossed with "PAIN" and is almost certainly a medicinal bottle. Two other lip/neck sherds are from wide mouth patent medicine bottles (eg. Wilson 1981:111) and may have contained pills. One of these, a clear bottle neck, has a hand tooled, flanged rim. The other, an aqua colored lip/neck, exhibits an improved tooled thickened collar lip typical of patent medicines and extracts.

Medicine Vial (20)

Twenty bottle sherds are from medicine vials (Table MF.10). One complete specimen (Fig. 15S) and 10 bases indicate a minimum of 11 bottles. The medicine vial is a small cylindrical bottle with flat base, long body, short neck, and flanged lip. Nine lips in the collection are all flanged. Bases indicate production in a two piece-hinged bottom mold (3), a three piece mold (2), and a one piece-dip bottom mold (1). Three specimens exhibit blowpipe pontil marks. Two have glass pontil marks, and one other, without a mark, was finished with a snap case. Two glass colors are represented including aqua (14) and clear (5). Many thin, small circumference, cylindrical body sherds in the collection are probably from medicine vials.

Medicine vials are found on many nineteenth century sites. Mercury discovered within two complete vials from the first Hermitage lead Smith et al.

(1976:173-174) to infer that these bottles held calomel. This heavy, white powder contained mercuric chloride and was used as a cathartic to cure intestinal worms.

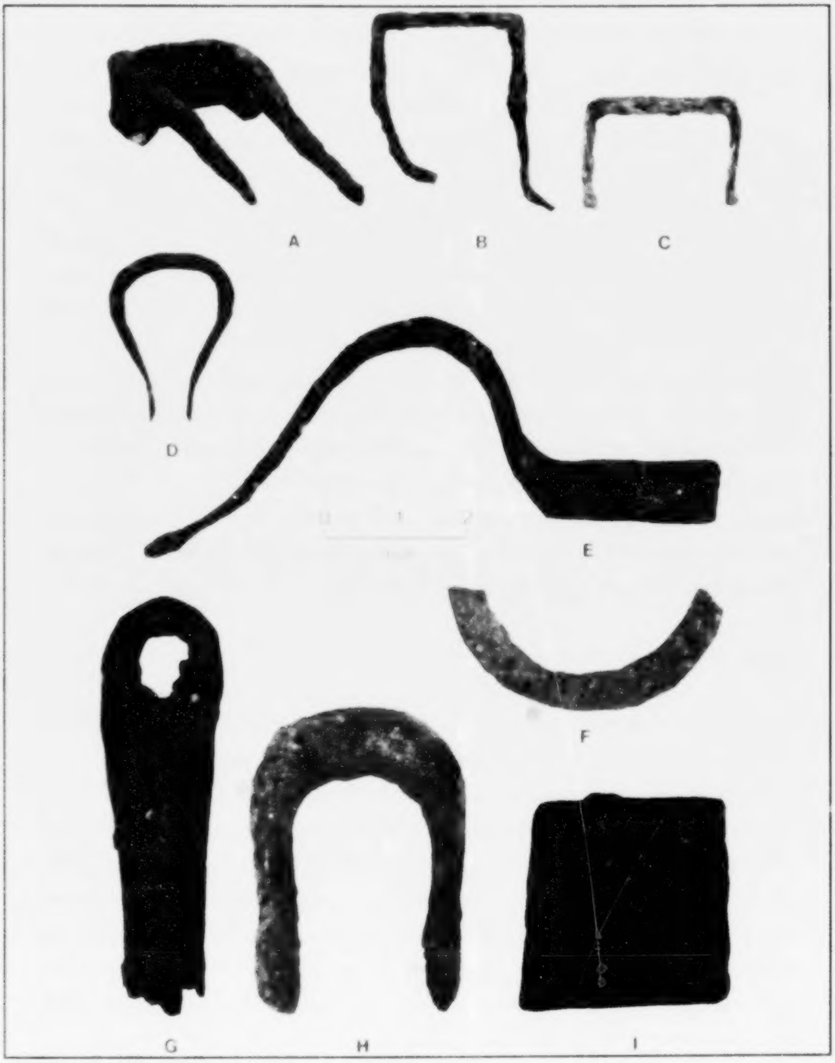
Transportation Artifacts

Equestrian trappings and wagon/harness equipment have been included as transportation class artifacts in the activities group. A total of 139 artifacts from 24 categories are distinguishable.

Wagon Bow Staples (12)

Twelve wrought iron, wagon bow staples occur in the Fort Smith collection (Fig. 25A-C, Table MF.42). These are manufactured from rectangular bar stock with prongs bent at right angles to the back. Prongs are then fullered to a sharp point. Driving such a staple into the side of a wagon creates a closed square capable of holding a wooden wagon bow. Identical "wagon bow staples" and wooden wagon bows were marketed in a period catalogue (Montgomery Ward 1895:597). Variation in the Fort Smith sample, however, indicates a hand forged product. Staples range from 1.02-2.45 inches interior width-to-1.45-3.0 inches in length. Interior width varies least, with the modal dimension being 1.8 inch. The average wagon bow staple exhibits an interior width of 1.85 inch and an overall length of 2.09 inches. Three examples are clenched. The distance between the wide portion of the shank to the clenched prong indicates widths of wagon planks ranging from .45, .5, and 1.15 inches. Wagon bow staples were also identified at Fort Washita (Lewis et al. 1975:115) and may suggest an affiliation with military supply wagons.

Figure 25. Wagon Hardware and Accessories. A-C) Wagon bow staples; D) Hame bottom loop; E) Wagon handle; F) Wagon wheel sand band; G) Pole and end strap; H) Clevis; I) Wagon wheel box.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Harness Buckles (21)

Twenty one buckles in the collection have been included in the harness buckle class (Fig. 24A-F, Table MF.43). Both brass and iron buckles are present, but composition is not related to either shape or size. Two buckle forms occur. Twelve buckles are rectangular shaped, eight are D-shaped, and one is indeterminate. Buckles range in size from .81-3.31 inches long and from .62-2.0 inches wide. The Fort Smith quartermaster requisitioned a variety of equestrian equipment that required buckles including: riding bridles; harness for horse teams, carts, mules, and ambulances; individual harness components such as martingales, girths, hame strings, neck straps, and halter straps; and spur straps (Bento 1988:108-109). Buckle size is undoubtedly a function of specific strap size. Discounting minor variation in interior width measurements, at least six sizes of buckles are recognizable at Fort Smith: 1/4 inch (1), 1/2 inch (2), 3/4 inch (6), 1 inch (4), 1 1/4 inch (3), and 2 inch buckles (4). Herskovitz (1978:87) maintains that all brass buckles smaller than 3/4 inch were used on saddle bags, spurs, and haversack flap straps.

Copper Harness Rivets (32)

Thirty two copper "belt rivets" (APT 1980:290-291) were recovered at Fort Smith that were probably used on harness (Fig. 24G, Table MF.44). All rivets have flat heads that range in diameter from .178-.45 inch. There is much variability within the sample, however, and specimens do not tend to cluster into distinct groups. Mean head diameter is .368 inch. One large, eccentric form with a head diameter of .757 inch was omitted from this calculation. Only two rivets are not burred and can be used to establish original length. The first is 1.0 inch long and the second is .637 inch long. The remaining rivets are burred. Burs are consistently larger than head diameters of rivets upon which they are used. Bur diameters range from .2-.455 inch with a mean bur diameter of .377 inch. The distance between burs and rivet heads should be a reliable indicator of the thickness of the riveted material. Bur/rivet head length ranges from .065-.25 inch with a mean length of .133 inch.

S-Hook (1)

A single hand forged, iron S-Hook occurs in the collection (Fig. 26B, Table MF.45). The artifact is a rectangular bar with ends bent in opposite directions to form a closed-S. The object is 3.85 inches long and 1.7 inch wide. An unclassified S-hook that is identical to the Fort Smith specimen has been recovered at Fort Bowie (Herskovits 1981:94) and may imply an association with the military. S-hooks probably represent ox-yoke hardware. The writer observed an identical artifact on an ox-yoke in a private collection. The S-hook acted as a rove for the ox-yoke staple. Two iron tenons inserted through mortices in the staple ends were prevented, by the S-hook, from being extracted or from damaging the yoke under a heavy draft. By 1865, however, the Russel and Erwin Hardware Company was marketing a threaded ox yoke staple with nuts and a rectangular perforated rove (APT 1980:147).

Yoke Ring (1)

An iron ring, .25 inch thick and 2.25 inches in diameter, was recovered at Fort Smith (Table MF.45). Identical rings from Fort Washita occur in two sizes. A large 2.2-inch diameter ring is interpreted as a neck yoke ring, and a smaller 1.25-inch diameter ring is interpreted as a harness ring (Lewis et al. 1975:248). The size of the Fort Smith specimen may indicate a neck yoke ring. The Russel and Erwin catalogue of 1865 marketed "ox yoke rings" of similar appearance (APT 1980:147).

Hame Bottom Loop (1)

One wrought iron, U-shaped clip, 2.47x1.8 inches, is similar to the hame bottom loop illustrated in the Montgomery Ward catalogue (1895:327). Prongs of the loop are perforated for a screw-type pin, and would have accomodated a 1.3-inch wide strap (Fig. 25D, Table MF.45).

Hame/Halter Eye (1)

One cast brass eyelet occurs in the collection. The object is an oval, 1.25x.661 inch loop for a .405-inch diameter rope. A rope eyelet of this diameter may have been used in conjunction with a hame or halter (Fig. 24I, Table MF.45).

Harness Chain (1)

A 1.4-foot long harness chain is composed of 10 chain links. Nine links are half-twist jack chain, 2.3x1.0 inches. One link is a large, oval connector link (Table MF.45).

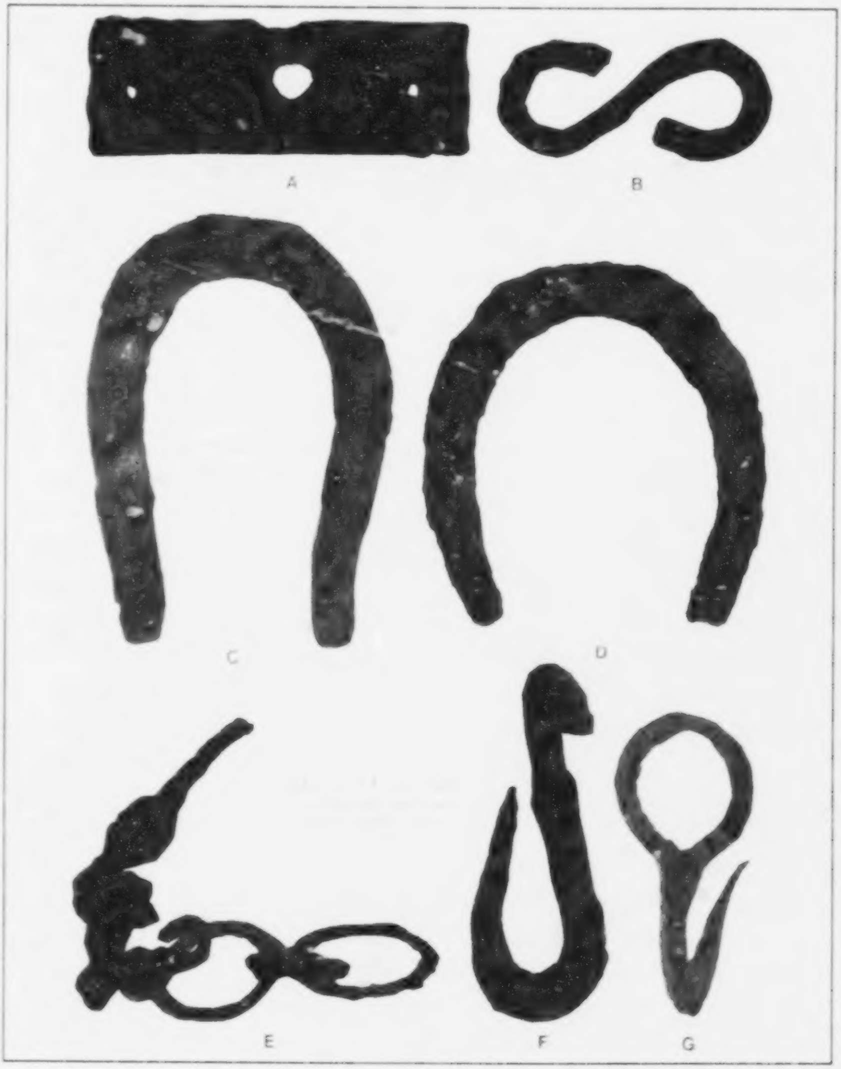
Swivel Eye Bolt Snap (1)

One swivel eye bolt snap, similar to an example in the Sears and Roebuck catalogue (1902:410), is composed of two sections: a .3-inch diameter loop fastened to a free turning .9x1.7-inch snap. Although damaged, the snap appears to be a spring-loaded bolt snap (Table MF.45).

Chain Swivel (3)

Three iron chain swivels from Fort Smith reflect two part construction (Table MF.45). The upper part is an oval-shaped swivel that moves freely in a collar. The lower part is a round or conical collar with an integral strap eye that supports the swivel. Three sizes of chain swivel are evident. Maximum diameter at the collar is 1.25, 1.1, and .85 inch, respectively. Interestingly, three sizes of "swivels" were marketed in the 1865 Russel and Erwin hardware catalogue (APT

Figure 26. Wagon Hardware and Horse Equipment. A) Wagon box rod plate; B) S-Hook; C) Muleshoe; D) Horseshoe; E) Breast chain; F-G) Whiffletree hooks.


A
B
C
D
E
F
G

1980:267). Both the Montgomery Ward catalogue (1895:394) and the Sears and Roebuck catalogue (1902:554) list identical specimens as "lariat swivels."

Neck/Breast Chain (1)

A neck or breast chain is composed of six half-twist jack chain links, 1.55x.75 inch, and three 1.9-inch diameter connector links (Fig. 26E, Table MF.45). A bipointed toggle bar or keeper, fastened to the most distal jack chain link, is designed to slip into a connector link on the opposite end of the chain. Points of the keeper turn downward and the center is perforated for suspension. Similar toggle chains have been recovered at Fort Washita (Lewis et al. 1975:247), Fort Bowie (Herskovitz 1981:88), and Fort Sill (Spivey et al. 1977:284). The Russel and Erwin hardware catalogue of 1865 illustrates various toggle chains for stage traces, cow ties, and breast chains. The military employed such toggle devices on both horse and mule harness--specifically as neck and breast chains (Herskovitz 1978:88).

Singletree Hook (2)

The excavation produced two hand forged iron hooks (Fig 26F-G, Table MF.45). The first hook exhibits a circular 2.1-inch diameter eye and a round, fullered shank with barbed tip. The hook is 4.9 inches long. The second hook has a 1.4-inch diameter eye and a round shank flattened out near the point. This hook is 4.25 inches long. Large iron hooks such as these are standard wagon equipment found on singletrees or whiffletrees. The 1902 Sears and Roebuck catalogue (1902:630) illustrates a a "lead bar singletree hook." The Fort Washita excavation produced similar hooks (Lewis et al. 1975:113).

Clevis (2)

Two clevis were recovered (Fig. 25H, Table MF.45). Both are U-shaped, cast iron clips mounted to a plow beam or wagon tongue. The first has an oval cross-section and measures 3.0x4.25 inches. Rounded tips or prongs contain .5-inch diameter perforations for a removable pin. Distance between the prongs indicates that this clevis is intended for use on a 1.9-inch thick beam. The second clevis has a rectangular cross section and measures 2.8x4.7 inches. Rounded prongs contain .25-inch diameter perforations for a removable pin. The distance between prongs indicates use on a 2.1-inch thick beam. A clevis identical to the Fort Smith specimens was recovered at Fort Richardson (Westbury 1977:54).

Endstrap (2)

Two endstraps are probably associated with a whiffletree or other wagon pole (Table MF.25). The first is a forged iron loop with fullered ends that is .5 inch thick at the widest point (Fig. 25G). The strap is 1.75 inch wide by 5.8 inches long and contains the remains of a wood pole. The second strap is a 1.0-inch wide, wrought iron band bent to form a three sided, open square. Both ends of the 3.1x2.5 inch endstrap are joined by a .37-inch diameter pin or rivet, indicating a beam span of three inches. This endstrap accomodated a 1x3-inch rectangular beam.

Pole Socket (1)

One iron pole socket is an open end, thimble-shaped ferrule identical to examples in the 1865 Russel and Erwin hardware catalogue (APT 1980:266). At the proximal end, the socket exhibits a .85-inch diameter, thickened rim. Overall length of the socket is .65 inch (Table MF.45).

Milonite Tack (1)

A single tack head stamped from sheet iron is a .75-inch diameter, flat headed tack (Table MF.45). A shank (broken) had been welded to the head. A similar tack depicted in a period wagon and blacksmith supply catalogue (Spivey 1979:152) is a "milonite tack" and is, apparently, for wagon and carriage upholstery.

Wheel Hub Box (1)

A fragmentary, cast iron hub box is a 2.86-inch wide, tapering cylinder with a projected diameter of four inches (Fig 25I, Table MF.45). The object ranges in thickness from .63 inch at the proximal end to .35 inch at the distal end. A .25-inch high rib--originally one of three--projects from the exterior of the box. These prevented the box from slipping inside the hub. Identical specimens have been recovered at Fort Bowie (Herskovitz 1978:89) and at the first Hermitage (Smith et al. 1976:213). The Russel and Erwin hardware catalogue of 1865 (APT 1980:254) depicts similar items called "cart and wagon boxes." These were sold in sets of eight with sizes ranging from two-to-seven inches. The wheel hub box from Fort Smith is probably associated with the military occupation. In 1859, the quartermaster requisitioned a replacement "wheel box" (Bento 1988:108).

Sand Band (1)

The excavation produced one fragmentary wagon wheel sand band (Fig. 25F, Table MF.45). Sand bands, for keeping the wagon hub box free of grit, were marketed in 1865 (APT 1980:266) and in 1895 (Montgomery Ward 1895:594). Sizes ranged from 3-4.5 inches in diameter (APT 1980:266). The example from Fort Smith is a narrow .6-inch wide, cast iron cylinder with a .45-inch wide flanged rim. Projected diameter of this sand band is 4.0 inches.

Wagon Brace (2)

Two rectangular iron bars in the collection may represent wagon braces. Both are manufactured from .25-inch thick iron stock (Table MF.45). The first has a partial length of 1.1 foot and varies in width from 1.28-.97 inch. Three .275-inch diameter rivet holes are evident and are spaced 4.5 inches apart. An iron rivet in one hole is 1.14 inch long and has a head diameter of .58 inch. The distance from the brace to rivet head indicates a plank thickness of .7 inch. A second brace is .3 foot long and articulates with the first specimen. Thus, a single brace with a length of 1.4 foot is represented.

Wagon Box Rod Plate (3)

Three wagon box rod plates were recovered (Fig. 26A, Table MF.45). Wagon box rod plates are rectangular-shaped sheet iron plates that engage a wagon box rod and are nailed to the wagon box for structural support. Variation among all three specimens probably indicates a hand made product. One is a 5.25x1.95 inch plate fashioned from .125-inch thick stock. Three perforations in the plate are for a centrally placed, .45-inch diameter rod, flanked by two .15-inch diameter nailer holes. A second specimen is a 4.5x1.86 inch plate of .1-inch thick stock. A centrally placed, .325-inch diameter hole for a wagon box rod is flanked by two .2-inch diameter nailer holes. The third example is a 2.77x4.27-inch plate of .21-inch thick stock. Five perforations include a central .975-inch diameter rod hole surrounded by four .2-inch diameter nailer holes at the corners of the plate. A period wagon hardware and blacksmith supply catalogue illustrates wagon box rods with similar plates (Spivey 1979:29).

Wagon Handle (1)

One wrought iron object (Fig. 25E, Table MF.45) resembles the manufactured wagon body/seat handles in a period supply catalogue (Spivey 1979:62). The 8.1-inch long handle exhibits a rectangular proximal end, 2.5x.91 inch, with two perforations. The first is a .4x.4-inch square hole and the second is a .3-inch diameter round hole. The handle has a round cross-section, fullered at the distal end. The body of the handle is curved to form a shallow hand hold and slightly recurved at the distal end where the handle is flattened for riveting to the wagon body/seat. The handle may have been used on a military wagon since an identical example was discovered at the Marshall Powder Mill in Texas (Luke 1978:80, Fig. 51A). The specimen from the Marshall Powder Mill is typed as a "miscellaneous artifact."

Bolts, Nuts, and Washers (10)

Two complete carriage bolts, two cut bolts with nuts, three isolated nuts, and three isolated washers were recovered (Table MF.45). One square head carriage bolt has a .75-inch diameter head and a .45-inch diameter shank. Overall length of the bolt is 3.1 inches. A second carriage bolt is an oval headed specimen with a 1.0-inch diameter head and a .55-inch diameter shank. Two partial chisel cut bolts represent the distal ends of two carriage bolts with .55-inch and 65-inch diameter shanks. Both have intact square nuts. Three isolated square nuts are for .3, .45, and .75-inch diameter bolts, respectively. Three iron washers have interior diameters of .55, .7, and 1.44 inches. All isolated nuts and washers would have accomodated large diameter bolts and are probably wagon hardware.

Horseshoes and Muleshoes (36)

Thirty-six horseshoes and muleshoes were recovered (Table MF.46). Most of the specimens are highly worn, however, restricting their usefulness. It can be ascertained that 10 shoes are oval-shaped with incurving heels and are intended for horses (Fig. 26B). Twenty-six shoes or 76% of the sample are

U-shaped with straight to excurving heels and are intended for mules (Fig. 26C). The high frequency of muleshoes is not surprising since Fort Smith, as a supply depot, maintained large herds of these animals for hauling freight. At Fort Smith, the military replaced oxen with mules in 1851. Mules were widely employed until 1859 when freight hauling was contracted out (Bento 1988:22, 57). Therefore, muleshoes at Fort Smith may date to the nine-year period from 1851-1859.

Eleven shoes in the collection are complete enough to be measured. The average horseshoe is 4.93 inches long by 4.44 inches wide. Muleshoes, which tend to be smaller, average 4.8 inches long by 3.74 inches wide. Although the reason is unclear, horseshoes in the collection reflect more uniformity in size than do muleshoes. Beyond the basic horseshoe/muleshoe dichotomy, shoes are formally similar. There is a complete absence of toe clips in the sample. All specimens but one exhibit fuller grooves for countersinking horseshoe nails. Heel calks are abundantly represented: 28 specimens have this traction improving device while only eight examples clearly have none. Since the toe-end of shoes seems to wear the greatest, the presence of toe calks could not be accurately measured. It is clear, however, that two specimens had no toe calks at all.

Eighty-nine percent of all horseshoes and muleshoes were recovered during the pedestrian trail mitigation over feature 72, an area containing quantities of blacksmith debris. An association between farrier and blacksmith related activities may be implied. The worn condition of all shoes recovered probably indicates their intentional removal in the post smithy.

Grommets (2)

Two grommets from the Fort Smith collection are relatively large copper eyelets of two-piece construction (Fig. 24H, Table MF.45). Both have exterior diameters of .583 inch with interior diameters of almost 1/4 inch--obviously designed for a heavy cordage. One grommet is crimped over a black colored, tight woven fabric--perhaps a canvass or cotton duck material. These grommets are probably from a large covering such as a tarp, fly, or tent. The Fort Smith quartermaster often requisitioned tarpaulins, and wagon and pack covers (Bento 1988:107) that would have contained grommets.

Blacksmith/Farrier Artifacts

The quartermaster ordered quantities of raw material for the blacksmiths at Fort Smith and its dependent posts. Several forms of requisitioned stock iron included band, round, square, tire (bar), sheet, hoop, nail rod, assorted steel, and square cast iron (Bento 1988:111). The blacksmith sized and cut stock as needs dictated. Several discreet steps or processes, as described in a period blacksmith manual (Richardson 1891), were used in the repair and production of metal objects:

> Fullering or swaging is the act of reducing or "drawing down" the diameter of stock by compressive blows.
>
> Upsetting is the process of enlarging stock by compressive blows.
>
> Severance occurs when stock is cut by chisel. Two types of chisel work are used. Hot chisel work cuts completely through the metal and cold chisel work cuts partly through the metal before the two sections are broken apart.
>
> Bending is the turning of metal to any angle or curvature.
>
> Punching is the process of creating screw or rivet holes.
>
> Splitting to divide stock into two or more parts is accomplished with a

machine called a "splitter." A hole is often punched at a predetermined point when a precisely measured split is required.

Welding is the process of joining two or more pieces of metal together. Several types of joints used include scarfed, lapped, cupped, and butted.

Brazing is the process of uniting two or more pieces of metal with melted brass or copper. The cuprous metal is set upon the seam to be joined and heated to the melting point.

At Fort Smith, 1,154 metal objects associated with blacksmith activity are present. These materials are predominantly concentrated in a linear arrangement in the test units over feature 72, an erosional cut intentionally filled with the metal debris.

Ferrous Metals

Ferrous metal objects constitute an overwhelming majority of blacksmith related artifacts--1,110 iron or steel artifacts represent 96% of the sample (Table MF.47). Six stock forms classified by cross-section are recognizable: plate (sheet), rectangular bar, square bar, half round bar, rod or round bar, and wire (Table 16). Many sections of stock are altered by fullering, upsetting, bending, severing, punching, splitting, and welding to produce a variety of biproducts and production forms (Table 17). Few shapes, however, can be formally identified at these intermediate stages of manufacture. Metal stock, biproducts, and resulting production forms are described in further detail.

Wire (32)

Thirty-two iron wire clippings from Fort Smith occur in a variety of gauges. Iron wire is commonly affiliated with blacksmith shops as associations at the Marshall Powder Mill (Luke 1978:221) and at the Matthewson House Site

(Spivey et al. 1977:221) indicate. The apparent association also holds for Fort Smith where wire was often recovered in squares that produced quantities of other metal debris. Wire could have been used in a myriad of tasks and a specific function is not indicated. Short lengths of wire from Fort Smith does indicate unusable scrap sections.

TABLE 16

Summary of Iron Stock Forms

Stock Forms	#	% ID Forms
1) Wire	32	4.3
2) Half Round Bar	2	.3
3) Square Bar	25	3.4
4) Rectangular Bar	298	40.6
5) Plate	207	28.2
6) Rod	170	23.2
Total	734	100.0

Miscellaneous Clippings (376)

These artifacts are eccentric metal clippings with numerous facets from hot chisel work. Too small to determine the type of original production stock, 376 artifacts are classified as "unknown" stock shapes or miscellaneous clippings.

Half Round Bar (2)

Only two sections of half round bar stock occur in the collection. One specimen is fullered but the intended production form is unknown.

Square Bar (25)

Twenty five objects represent square bar stock. Twelve sections of square bar, because of their small use-limiting size, are unaltered. Three specimens are fullered but their intended production forms are unknown (Fig. 27G-H). Four fullered square bar sections exhibit chisel-like points and probably represent the production of spikes. None of these, however, have been upset to form heads. Another fullered bar is a bipointed chain keeper--probably for a breast chain or cow-tie. It has not been perforated. Three other square bar sections are fullered and scarfed for welding, fullered and bent, and bent, respectively. Their intended production forms can not be determined. One object, fashioned from square bar, is obviously an incomplete pick-axe (Fig. 27I). The tool is curved and fullered to a point. Two scarfed surfaces on the proximal end of the object represent points of attachment for a welded eye.

TABLE 17

Summary of Iron Production Forms

Production Forms	#	% ID Forms
1) Horseshoe	290	70.5
2) Nut	17	4.1
3) Bolt	7	2.0
4) Washer	1	.2
5) Chain Link	74	18.0
6) Chain Keeper	1	.2
7) Spike	4	1.0
8) Handle/Brace	2	.5
9) Pick	1	.2
10) Fork	1	.2
11) Wrench	1	.2
12) Rounded Stem	11	2.7
13) Ferrule	1	.2
Total	411	100.0

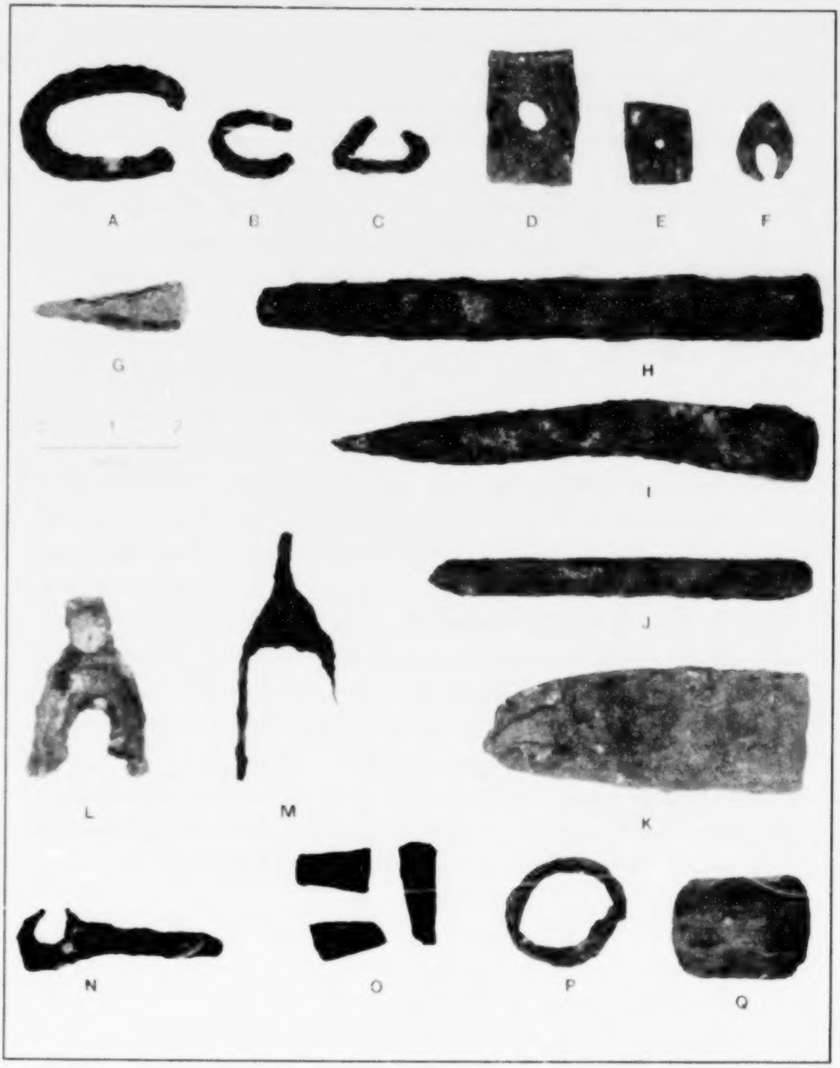
Rectangular Bar (298)

Rectangular bar stock is well represented and 298 objects identifiable to this shape occur in the collection. Because of their small use-limiting size, six sections of rectangular bar stock are unaltered. Six larger sections reflect a combination of fullering and bending operations. These are horseshoes in various stages of production. Most, or 284 clippings, are short sections with fullered ends (Fig. 27O). These have been severed by hot chisel work in the final phase of horseshoe production when shoes were sized for an individual fit. Horseshoe clippings are abundant at other blacksmith shops and military sites. Two artifacts fashioned from rectangular bar stock represent unknown production forms. The first is a fullered rectangular bar with a punched rivet/screw hole. The second is a complex object consisting of a rectangular bar welded to a square section of plate stock. The majority of rectangular bar stock, however, can be directly linked to farrier activities (97%).

Plate (207)

Plate stock is represented by 207 flat iron objects that reveal several production forms. Most, or 168 plate clippings, are small or irregular shaped with limited reuse potential (Fig. 27K). Thirty-five artifacts are related to the production of bolts and nuts. These plate sections are cut in square to slightly rectangular shapes. One square plate section is a potential bolt head. Fourteen other square plate sections, however, are perforated nut forms (Fig. 27D-E). Holes range from .25-.6 inch in diameter. Eighteen plugs in the collection may have resulted from nut production or the punch and split technique. These were distinguished from short sections of rod stock based on grain direction. On plugs, the grain runs across the direction of the punch. Plugs range from .32-.75 inch in diameter with the average size plug being .6 inch in diameter. One round, punched plate section may be a washer. A square plate section is intentionally cupped to create a surface for welding an upset rod.

Figure 27. Iron Production Debris. A-C) Chain link forms; D-F) Perforated plate sections; G-H) Fullered square bar; I) Pick-axe form; J) Bolt form; K) Plate stock clipping; L) Wrench form; M) Fork form; N) Unidentified production form; O) Horseshoe clippings; P) Ferrule; Q) Rod stock clipping.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A bolt head is indicated. A period blacksmith manual describes an identical method for producing bolts (Richardson 1891:43). Four additional objects do not appear to be related to nut or bolt production. One is an irregular-shaped, punched plate. Another section of plate with a .5-inch diameter punched hole is shaped like a teardrop (Fig. 27F). This is identical to an unidentified production form from the Marshall Powder Mill (Luke 1978). One plate section is scarfed, rolled, and welded to create a 1.25-inch diameter ferrule (Fig. 27P). One piece of split plate stock resembles a wrench (Fig. 27L). The remaining three plate sections represent undetermined production forms.

Rod (170)

Sixty-four unaltered sections of rod stock are short pieces with limited potential for reuse (Fig. 27O). Eleven sections of rod with upset ends are "rounded stems" for welding to cupped plate stock. According to Richardson (1891:43), these probably resulted from bolt production. Three rod sections are threaded and definitely represent production or recycling of bolts. In each case, plate stock had not been welded to the proximal ends of the rod to form bolt heads. Seventy-four sections of bent rod stock are related to the production or maintenance of chain. All are chain link forms reflecting the process of bending and welding (Fig. 27A-C). Nine specimens separated at the joint reveal that chain link edges were scarfed prior to welding. One object appears to be a large serving fork and exhibits both bending and splitting techniques (Fig. --M). Two specimens are rod sections with flattened and punched ends, and may indicate the manufacture of handles or braces. Seven and eight specimens are bent and fullered rods, respectively. Their intended production forms are unknown.

Cuprous Metals

Copper and brass production stock occurs in limited quantities. Three forms are represented: melted metal, miscellaneous cut metal, and wire (Table MF.48).

Melted metal (10)

Ten drops of melted brass and copper were recovered that weigh from .9-61.7 grams. The average weight of melted cuprous metals is 9.7 grams. All 10 specimens were recovered from proveniences that also produced quantities of ferrous scrap metal--biproducts from a blacksmith shop. Melted drops of cuprous metal probably result from brazing, a welding process using brass or copper. Copper or brass is laid on the seam to be welded and heated to the melting point (Richardson 1891:110).

Miscellaneous Cut Metal (8)

Eight pieces of copper from Fort Smith all exhibit hot chisel marks, indicating a definite sectioning attempt. All specimens occurred in proveniences that yielded quantities of ferrous scrap metal--suggesting an association with a blacksmith shop. The cut copper scraps were probably intended to be recycled and used in the brazing process. These range in weight from 1.3-19.4 grams and on the average, weigh 5.6 grams.

Wire (26)

Twenty-six sections of copper wire were collected from 21 proveniences. Thus, copper wire was neither abundant nor concentrated. Nearly all of the recovered specimens do occur in test units that produced quantities of blacksmith related debris. An association between copper wire and blacksmithing is implied. The wire could have been scrap intended for use in brazing. The recovered wire sections reflect as variety of gauges that range from .02-.21 inch in diameter. The modal wire diameter is .05 inch.

Construction Tools

Eleven artifacts in the collection represent six construction tool types: axe, three-cornered file, flat file, cold chisel, coopers' hammer, and drawknife (Table MF.29). All of these objects were commonly requisitioned by the quartermaster for use at Fort Smith and its dependencies (Bento 1988:107-118).

Axe (1)

An iron "Kentucky pattern" axe (APT 1980:203) was recovered (Fig. 28B). The axe head exhibits a broad, heavy poll with flaring bit and downpointing ears at the base of the eye. Measured from poll-to-bit, the axe head is eight inches long and measured at the eye is one inch thick and 4.5 inches wide. The oval shaped eye measures .8x2.4 inches. The axe was discovered in the builder's trench of the fireplace foundation in feature 19 and is certainly associated with the military. The poll of the axe is lightly peened, indicating some use in hammering--perhaps during construction of this temporary barracks.

Three-Cornered File (3)

Three triangular or three-cornered files are represented in the collection (Fig. 28G). All are similarly constructed and range in thickness from .38-.5 inch. The only complete specimen is 5.3 inches long. Two exhibit 1-inch long pointed tangs for socketed wood handles. Two specimens reflect fine, single-cut surfaces and the third file is too corroded to determine the cut.

Flat File (3)

In spite of the fragmented condition of three flat files, it is evident that three sizes are represented (Fig. 28H). Flat files occur in widths of .65, .9, and 1.08 inch and range from .23-.25 inch thick. Formally, all three files are similar. Two exhibit pointed tangs, 1.0 inch and 2.3 inches long, for socketed handles. Only one file has an original surface and it displays a fine, single cut.

Figure 28. Tools. A) Cast iron plowpoint; B) Axe; C) Trade hatchet; D) Coopers' hammer; E) Cold Chisel; F) Drawknife; G) Three-cornered file; H) Flat file; I) Drawknife.

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I

Cold Chisel (1)

An iron cold chisel is .9 inch in diameter and 5.0 inches long (Fig. 28E). The tip is fullered or flattened to a cutting bit. The proximal end or head of the chisel is peened from hammer blows. The artifact is probably associated with blacksmith activity and the tools required for this indispensable function were ordered in complete sets by the Fort Smith quartermaster (Bento 1988:111).

Coopers' Hammer (1)

A large, forged iron hammer with chisel bit is called a "coopers hammer" (APT 1980:220) or in an 1891 guide to blacksmithing, "cold chisel" (Richardson 1891:147). The Fort Smith specimen, broken at the eye, is represented only by the bit section (Fig. 28D). The hammer is 1.05 inch thick and 1.53 inch wide at the eye. The widest point on the hammer, at the bit, is 1.42 inch. From eye to bit, the hammer is 3.4 inches long.

Drawknife (2)

Two drawknives are present. One forged, iron blade fragment, 2.05 inches wide and over 10 inches long, exhibits upturned ends at the handles (Fig. 28I). The blade is thickest, .2 inch, at the back. The second blade is a curved, 6.0-inch long, .82-inch wide "hollowing knife" (APT 1980:218). A probable coopers' tool for producing barrel staves is indicated (Fig. 28F). Handle construction of the Fort Smith specimen, however, is unique. Although the handles are broken, their points of attachment are evident. Each was joined by welding to the top of the blade, 1 inch from each end of the tool.

Agricultural Tools

Plowshare (2)

Two plowshares are represented at Fort Smith by cast iron plowpoints (Fig. 28A, Table MF.39). Plowpoints, on the leading edge of the plow, cut through the tough sod and by necessity could be removed for sharpening and laying (Richardson 1891:25). One recovered specimen is a nearly complete plowpoint with a countersunk screw-hole for mounting to the plowshare. It is 6.0 inches wide with a partial height of 8.0 inches. The second plowpoint is represented by the tip section--it is incomplete and unmeasurable. Both plowpoints are from left handed walking plows. Soldiers were not strangers to farming and the garrison of the second Fort Smith maintained a garden (Coleman and Dollar 1984:53). Plows were requisitioned by the quartermaster, for a September 30, 1850, post inventory reveals that Fort Towson had two plows on hand (Bento 1988:111).

Indian Trade

Several artifacts in the assemblage could be linked to Indian trade such as glass beads, rosary medallion, and a pipe hatchet. Only the pipe hatchet can be included here with any degree of certainty. Beads and a rosary medallion are described in the jewelry class of personal group artifacts.

Pipe Hatchet (1)

One iron artifact excavated at Fort Smith is an Indian trade-pipe hatchet (Fig. 28C, Table MF.39). The poleless hatchet is composed of a tapering eye welded to an expanded blade with excurvate bit. Diameter of the hatchet eye decreases from .95 inch at the top to .875 inch at the bottom. The eye of the implement is perforated to emit tobacco smoke but the pipe bowl is broken and was not recovered. The top blade margin, from eye to bit, is straight while the bottom blade margin curves downward to create a flared bit. Overall, the hatchet is 4.35 inches long, 1.2 inches wide at the eye, and 2.05 inches wide at the bit.

MISCELLANEOUS AND UNIDENTIFIED ARTIFACTS

Four objects could not be identified or placed within a functionally specific artifact group (Table MF.49). These include a copper tube, an ornately stamped and rolled sheet brass article, a copper washer, and a component from an unidentified machine.

Copper Tube (1)

One section of copper tube from Fort Smith is cut at both ends. The tube has a .2 inch diameter and is 1.0 inch long. Copper tubing occurs at Fort Washita (Lewis et al. 1975:190) and may imply a military association. Function of the object, however, is unknown.

Stamped Sheet Brass (1)

One section of thin, rolled sheet brass bears an intricate stamped floral design. The artifact is damaged but is .25 inch in diameter and at least 4.5 inches long. Function is unknown.

Copper Washer (1)

A single copper washer in the collection is stamped from .01 inch thick (one mil) sheet metal and exhibits an internal diameter of .25 inch. Use of the washer has not been determined.

Brass Machine Component (1)

One stamped, sheet brass object is a convex, cup-shaped device (Fig. 24K). Two perforated lugs protrude from the 1.0 inch diameter rim and probably served as points of attachment for one or more additional machine components. The base of the object exhibits a perforation lined with a brass grommet to create a smooth edge. A cord or rope may have been pulled through this hole. A patent date is stamped on the exterior surface but is only partially legible: "PAT OCT 27---."

PREHISTORIC ARTIFACTS

Archeological testing and excavation within the buried historic ground level produced 328 prehistoric artifacts (Table 18, Table MF 50). Additionally, one projectile point and one potsherd from Belle Point, because of their diagnostic value, are considered here as well.

Cores and Debitage

Tested Pebble (10)

Ten rolled chert gravels all exhibit at least one flake removal. Tested pebbles are predominantly unheated and average 60 grams in weight. Presumably, these pebbles were not suitable for further reduction.

Polymorphic Core (4)

Opportunistic flake removal from a chert pebble results in a multifaceted or polymorphic core. Four cores averaging 13 grams in weight were recovered. A single specimen is thermally altered.

Primary Decortication (12)

Primary decortication flakes represent the first flake removals on a nodule or core with the main purpose being the removal of unsuitable outer cortex and the creation of a striking platform. Primary decortication flakes are characteristically thick with a pronounced bulb of percussion resulting from direct hard hammer percussion flaking. The striking platform may or may not be covered with cortex while the dorsal surface is completely covered. Twelve primary decortication flakes were recovered. Two flakes or less than 17% of all decortication flakes are thermally altered.

Secondary Decortication (40)

Forty secondary decortication flakes that resulted from continued preparation and shaping of the core, were recovered. These flakes are thick with pronounced bulbs of percussion. Platforms are usually free of cortex and the dorsal surface exhibits at least one scar from a previous flake reomoval. Thus, dorsal surfaces are only partially covered with cortex. Fourteen or 35% of all secondary decortication flakes are thermally altered.

Interior Flakes (101)

Interior flakes are created by further hard hammer reduction of the core and are intended to serve as specialized flake tools or with further alteration, as bifacial implements. These flakes are relatively large with pronounced bulbs of percussion, unprepared striking platforms, and normally lack cortex. The Fort Smith excavation produced 101 interior flakes, 28 of which are thermally altered.

Thinning Flakes (102)

Thinning flakes are usually produced by soft hammer percussion flaking during the final shaping and thinning phase of biface reduction. The pedestrian trail investigation produced 102 thinning flakes. These exhibit previous flake scar removals on the dorsal surface, a prepared platform with intentional grinding, lipping on the platform edge, and a diffuse bulb of percussion. Thirty three (32%) thinning flakes are thermally altered.

TABLE 18

Total Prehistoric Artifacts
From The Buried Historic Ground Level
On The Railroad Median Strip

Identification	Heated		Unheated		Total	
	#	wt.	#	wt.	#	wt.
Primary Decortication	2	2.8	10	60.3	12	63.1
Secondary Decortication	14	28.1	26	78.2	40	106.3
Interior	28	46.5	73	174.6	101	221.1
Thinning	33	17.1	69	45.0	102	62.1
Tertiary	6	1.2	6	1.4	12	2.6
Shatter	8	21.9	3	11.8	11	33.7
Potlid Spall	1	.7	0	0	1	.7
Polymorphic Core	1	4.9	3	46.9	4	51.8
Tested Pebble	1	41.6	9	559.2	10	600.8
Preform	2	33.7	7	168.7	9	202.4
Biface Fragment	1	3.4	9	22.1	10	25.5
Projectile Point	4	33.3	0	0	4	33.3
Ground Soapstone	0	0	1	5.7	1	5.7
Ground Schist	0	0	5	21.3	5	21.3
Dome Scraper	1	17.9	0	0	1	17.9
End Scraper	1	4.0	0	0	1	4.0
Potsherd	1	5.4	0	0	1	5.4
Burned Clay	3	11.0	0	0	3	11.0
Total	107	273.5	221	1195.2	328	1468.7

Tertiary Flakes (12)

Twelve tertiary flakes were recovered. This category includes small, thin flakes with well-prepared platforms. Tertiary flakes are removed by a hand held pressure tool in the final phase of biface reduction and may result from either intentional thinning, sharpening of lateral biface edges, or notching a preform in some industries. It is virtually impossible on the basis of macroscopic analysis, to distinguish between unintentional, low-intensity percussion flakes, inadvertently produced throughout the reduction sequence, and pressure flakes with crushed platforms. Both varieties are included in the tertiary flake category. Because of their small size, tertiary flakes reflect a biased recovery rate.

Shatter (11)

This category includes thick, angular fragments of chert without thin edges or bulbs of percussion. Shatter is the result of hard hammer percussion blows that terminate along old fracture planes in the raw material. Shatter may also be produced from intense and uneven heat. Eleven shatter fragments were collected. Eight or 73% of this number exhibit evidence of heating.

Potlid Spall (1)

This small, oval-shaped chert spall is a naturally occurring biproduct of thermal alteration. Intense heat often causes chert surfaces to exfoliate or potlid. The object could be affiliated with the prehistoric occupation at Fort Smith.

Preform (9)

Nine bifaces are intact enough to be identified as preforms. All are ovate preforms in various stages of thinning. Surfaces are characterized by broad, randomly placed flake scars and preform edges are irregular or sinuous. Only two specimens are thermally altered.

Biface Fragment (10)

Ten bifacially worked tools are too fragmentary to identify and could represent preforms or bifacial tool forms. Only one specimen has been thermally altered.

Projectile Points

Jakie Stemmed Point (1)

One projectile point with an expanding stem, concave base, and broad, slightly barbed shoulders is a Jakie Stemmed Point (Fig. 29C). The large triangular blade exhibits excurvate lateral blade margins and at the shoulders, is 46.4 mm. wide. The stem is 16.5 mm. long. Blade surfaces are characterized by broad, random percussion flaking with well placed basal thinning flakes and limited pressure retouch. The base, stem, and lower blade edges are lightly ground. The Fort Smith specimen is identical to other Jakie Stemmed points from [illegible] west Arkansas (eg. Stahle 1986:14) where they are believed to be affiliated with Early-to-Middle Archaic cultures from 9,500-5,000 B.P. (Sabo et al. 1982:[illegible]).

Table Rock Point (1)

A single Table Rock projectile point is represented by the base of a small, expanding stem dart point with slightly sloping shoulders and excurvate basal margin (Fig. 29D). The widest point on the blade is 21 mm. and the stem is 8 mm. long. Surfaces of the artifact exhibit randomly placed percussion flaking and a poorly thinned base with light edge grinding. Similar specimens from Missouri, northwest Arkansas, and northeast Oklahoma are all classified as Table Rock Stemmed Points (Chapman 1975:258; Sabo et al. 1982:61; Perino 1968:96). The Table Rock point from northwest Arkansas and Missouri is believed to date to the Late Archaic period, ca. 3,000-1,000 B.C. (Chapman 1975:258).

Marshall Point (1)

One Marshall point in the collection was recovered during testing on Belle Point from test 66, section 1. It is a large dart point with corner notches, barbed shoulders, and an expanding stem with straight base (Fig. 29A). The oval-shaped blade exhibits excurvate lateral blade margins. The stem is notably short in proportion to the blade. An impact fracture is evident at the blade tip, but the dart point is at least 68 mm. long. The stem is 11.4 mm. long. The greatest width, 31.3 mm., is on the blade, 1/3 of the length below the tip. Projectile point surfaces exhibit broad, randomly placed percussion flakes with a thinned, lightly ground base. Grinding extends upward to the lower blade margins. The Marshall point from Fort Smith is similar to examples from northwest Arkansas (Stahle 1986:15). Bell (1958:44) suggests that this point type dates to the 4,000 B.C.-1,000 A.D. time period.

Gary Point (2)

Two artifacts can be identified as Gary points. The first specimen is a fragmented, constricting-stem point with a straight-to-lightly barbed shoulder (Fig. 29E). It is not large enough to be measured. The second specimen is a nearly complete, medium size dart point with broken tip (Fig, 29B). It measures over 63.7 mm. in length and 26.25 mm. wide at the shoulder. The constricting stem is 21.4 mm. long. This specimen exhibits a triangular blade with slightly convex lateral blade margins, sloping shoulders, and a stem that constricts markedly to form a pointed base. Projectile point surfaces reveal broad, randomly placed percussion flakes. Stem edges are ground. Identical specimens from the Moss Shelter in northwest Arkansas are called "Gary A" points by Stahle (1986:14). The style is widespread throughout the eastern United States and is affiliated with Late Archaic and Woodland period cultures. In Arkansas,

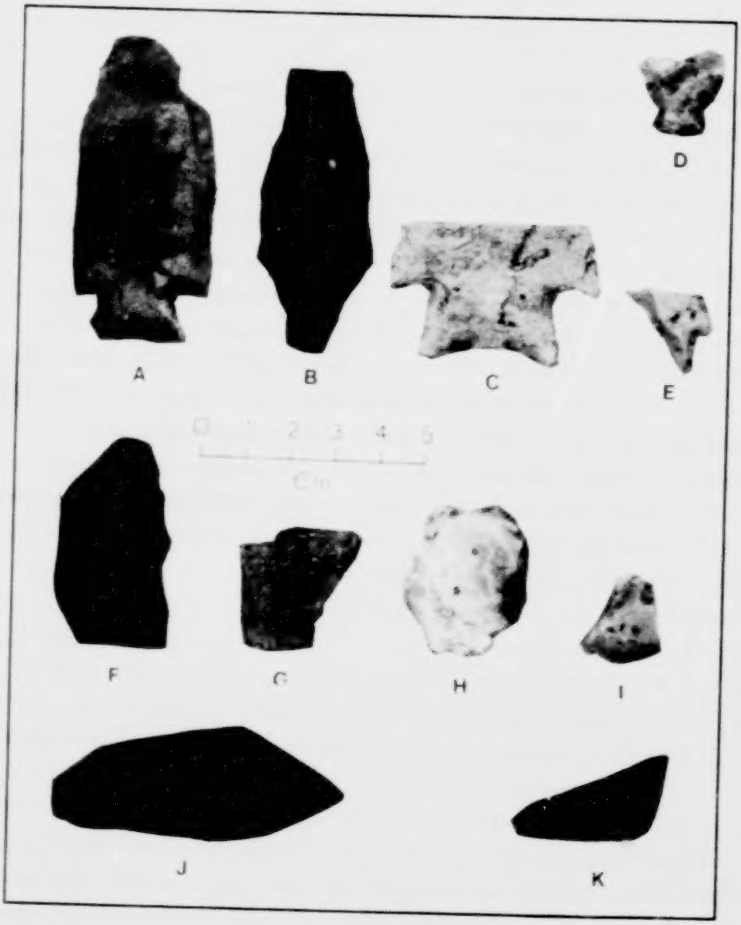

Figure 29. Prehistoric Artifacts. A) Marshall point; B) Gary point; C) Jakie Stemmed point; D) Table Rock point; E) Gary point midsection; F) William's Plain sherd; G) Woodward Plain sherd; H) Dome scraper; I) End scraper; J) Ground schist; K) Ground soapstone.

the Gary Point is believed to date from 5,000 B.C.-1,000 A.D. (Sabo et al. 1982:61).

Potsherds

Williams Plain (1)

One ceramic sherd was recovered from section 5 of test 62 on Belle Point. The sherd is from an 8.8-mm. thick, curved wall, clay tempered vessel with a grey core and buff colored surfaces (Fig. 29F). A Williams Plain vessel is indicated. Williams Plain ceramics are associated with the Woodland period Fourche Maline phase. A local cultural variant in the Arkansas River Valley is the Gober complex with suggested dates of 1,650-1,050 B.P. (Sabo et al. 1982:61).

Woodward Plain (1)

One badly leached, shell tempered sherd is from a 7.25-mm. thick, curved wall vessel with a grey interior surfaces, buff core, and dull, orange colored exterior (Fig. 29G). The sherd probably indicates a Woodward Plain vessel, associated with the Mississippian period from ca. 1,100-500 B.P. (Chapman 1980:303).

Scrapers

Dome Scraper (1)

One oval-shaped scraper (Fig. 29H) with plano-convex cross-section measures 29x35 mm. in diameter and is 16 mm. thick. Natural cortex forms the ventral surface of the scraper while steep percussion flaking on edge margins produced a dome-shaped dorsal surface. Use wear is not evident.

End Scraper (1)

One small end scraper, 22x18.6 mm., is made on an interior flake and exhibits a pointed distal end and a rounded bit (Fig. 29I). The bit is steeply flaked at a 45 degree angle and exhibits edges dulled from intensive use.

Ground Stone

Soapstone (1)

One fragmented, ground stone artifact is manufactured from a grey-to-buff-to-rose colored soapstone or steatite (Fig. 29K). The soft stone exhibits abraded surfaces. The ventral surface is flat and the dorsal surface is multifaceted. Although the overall form of the artifact can not be ascertained, three edges are apparent. One complete edge is 32 mm. long. Facets on the dorsal surface emanate from these edges and converge in the center of the object. The thickest point, at the center, is 7.1 mm. thick. The ground soapstone artifact is probably a fragmented pipe or gorget of aboriginal manufacture.

Schist (5)

Five fragments of schist, a soft, silvery colored metamorphic rock, are presumably exotic to the area. All are from the same artifact--a flat, 8.1-mm. thick, oval-shaped object (Fig. 29J). The schist may represent a gorget of aboriginal manufacture.

Burned Clay (3)

Three lumps of burned clay were recovered that could be associated with prehistoric occupation. These are relatively small and average only 3.3 grams in weight.

DISCUSSION

The purpose of this discussion is to synthesize the varied data generated by the pedestrian trail investigation. The artifacts described in Chapter 5 will be used to address the research questions originally proposed in Chapter 1. Problems with the artifact sample, however, limit the following interpretation.

The artifacts used here originated as sheet midden and in the absence of stratification and distinct artifact bearing features, temporal and contextual control is less than ideal. Artifacts in the buried historic ground level were deposited from ca. 1817-1898/9, by both military and civilian residents. Yet, the sample is undisturbed by surrounding urbanization, displays integrity of location, and is useful for comparative purposes. A majority of the artifacts clearly originate from the time period of the second Fort Smith and are probably affiliated with laundress row, a series of temporary barracks that occupied the area. By comparison, first fort and later civilian occupations are poorly represented and will probably not affect interpretations based on quantitative analyses. Artifact descriptions presented in Chapter 5 have, whenever possible, attempted to determine whether artifacts originated from a civilian or military population.

> 1) How were areas beyond the garrison wall structured and used by occupants of the first Fort Smith?

Archeological investigation for construction of the pedestrian trail offers few insights into activities outside the wall of the first fort. Cultural deposits on Belle Point are very disturbed and hold little-to-no potential for recognizing spatial patterns. The location of one historic outbuilding (F77), however, has been confirmed.

Feature 77 was discovered during archeological monitoring of trail construction and as a result, has not been completely investigated. Feature 77 is a pit containing cultural fill and is probably a cellar or privy associated with the first Fort Smith. Diagnostic artifacts contained in the feature indicate deposition sometime in the 1820s before the widespread appearance of clear glazed ceramics. Using a minimum vessel count, a mean ceramic date of 1813.4 was calculated. Because of the small sample size (seven minimum vessels), however, the date is probably biased and underestimates the age of feature 77 by at least seven years. Visual bracket dates, also based on ceramic types, suggest an occupation range sometime between 1820-1830. Feature 77 is located only 50 feet from the foundation of the southwest blockhouse and seems to be oriented 74 degrees east of north or 25 degrees off the first fort axis. The situation of the structure is unusual since known historic buildings summarized by Coleman and Dollar (1984:Fig. 11) all conform to the first fort axis and the nearest documented building is 120 feet from the stockade foundation. Additional investigation is necessary to identify and delineate feature 77.

2) How were areas beyond the garrison wall structured and used by occupants of the second Fort Smith?

Archeological investigation of the buried historic ground level on the median strip provides an excellent opportunity to examine an area beyond the walls of the second fort. The second fort exterior, at least within the shadow of the garrison wall, was the subject of intensive use. Three distinctive use-areas were encountered here including a possible prepared drive for the Quartermaster Building, a dumpsite for the post smithy, and the site of a barracks from laundress row.

Feature 25 is a possible driveway for the Quartermaster Building (Appendix 1). The feature is a widespread area of sandstone chips that extends some 60 feet from the Quartermaster Building where it parallels the south wall (left face) of that structure. The dense sandstone concentration is .2 foot thick and contains 433 stone chips per square foot area. Feature 25 is probably an 1839 construction surface where masons hand dressed construction stone for the

Quartermaster Building. Since supply wagons unloaded on the fort exterior at this location, the stone debris probably also served as a driveway. Expectedly, the frequency of residential artifacts is low in this high traffic area. One of two lead bale seals generated by the project came from feature 25, however, and probably indicates shipping activity.

Located south of the hypothesized quartermaster drive is feature 72 (Appendix 1), an erosional disturbance that may have been created by differential runoff from the dense concentration of stone chips. The erosional feature parallels feature 25. Feature 72 is intentionally filled with metal debris from a blacksmith shop (Appendix 1) and 1,154 metal stock clippings and production forms were recovered in overlying test units. An identical situation occurs at another military site, the Marshall Powder Mill (Luke 1978:25), and indicates that this method of disposal is not unique. Apparently, care was used at Fort Smith to keep metal production debris from high traffic areas over the quartermaster drive and from residential areas a short distance south of feature 72. Metal stock clippings and construction debris occur only in a circumscribed area over feature 72.

Feature 19, a fireplace foundation and extensive sheet midden covering much of the south end of the median, marks the site of a barracks from laundress row (Appendix 1). In at least one case, a secondary refuse deposit in a natural depression was observed (F20) that is also associated with laundress row. Features 19 and 20, and their relationship to laundress row are considered in further detail in discussions of questions four-to-seven.

3) What differences exist between the use of space within and beyond the wall of the second Fort Smith?

The assessment of research topic 3 is qualitative. Only phase I testing was necessary along that section of proposed trail within the second fort area and the artifacts recovered there have not been tabulated. Yet, the observed difference in abundance and type of artifacts within and beyond the second fort wall is striking.

Compared to historic ground levels identified beyond the garrison wall, zone 5 on the visitor center lawn has a sparse concentration of artifacts. The most common items from this historic ground level are slate shingle fragments--probably from roofing episodes, and cinders--probably from coal burning stoves in the soldiers barracks. A lack of residential debris is notable. This difference may relate to the fort interior/exterior and the relative degree of policing activity each location received. It is proposed that highly visible areas within the fort walls were subject to intensive policing activity whereas temporary quarters beyond the fort walls were infrequently policed or not cleaned at all. Extensive sheet middens with concentrated kitchen refuse and residential debris are the rule in such areas.

4) What is the location and orientation of laundress row?

Feature 19, a fireplace foundation in test 36, section 5 and test 48, represents one of five structures from laundress row (Appendix 1). Since other structural remains were not identified, this foundation is the sole indication of the location and orientation of laundress row. In all probability, evidence of the remaining barracks was destroyed by construction of the adjacent railroads. The buildings in laundress row were formally arranged in a straight line extending south of the garrison wall, evidently a site predetermined by a surveyor. Feature 19 reveals that laundress row is oriented 40 degrees east-of-north, conforming to the axis of permanent buildings within the fort walls.

5) How were the buildings in laundress row constructed?

The only structural remains encountered consist of a fireplace foundation (F 19) for at least a two room building. Artifact distribution and differential soil compaction, however, may indicate that building dimensions are approximately 22x44 feet. Since a continuous foundation is not present, it may be inferred that the superstructure rested atop piers placed at the corners. Phase II testing was inadequate to locate pier sites, but the extensive distribution of residential debris in areas that would have been concealed by the structure supports this inference.

A number of observations suggest construction details of this building. First, regarding the fireplace, it is an H-shaped 4.7x7.2-foot square foundation of undressed sandstone blocks cemented together with orange colored mortar. At least three courses of stone remain intact. The uppermost course had clearly been removed during demolition and therefore, evidence of former hearth and floor level does not exist. Brick fragments were abundant in the vicinity of the fireplace. Several exhibit indications of use. Orange mortar adheres to eight, one is whitewashed, and two bricks are burned. Based on these use patterns, it is evident that eight bricks were incorporated in stretcher courses with sides exposed. One other example was used in an unusual exposed face position such as a sailer or shiner course (eg. Hill 1986). The whitewashed specimen was probably exposed on the building interior. All of the bricks could have been incorporated into a brick chimney shaft. Two bricks mortared together reveal a mortar gap of exactly one half inch. Only the fireplace foundation was stone.

Numerous plaster fragments found in the vicinity of the fireplace indicate that the building was of frame and lath construction. Nail pennyweights represented in the sample generally confirm this supposition. Nail pennyweights from 3d-30d are prominently represented (Figure 30). Pigment adhering to the surfaces of plaster fragments reveal that the interior of the structure was whitewashed. High frequencies of window glass in the vicinity of feature 19 imply a well lighted and ventilated structure with numerous windows. A corresponding increase of slate from overlying units indicates that the building may have supported a slate roof.

The barracks represented by feature 19 was constructed with recycled building materials. The stone in the fireplace foundation is definitely a recycled product as some stones at the bottom of the builder's trench are

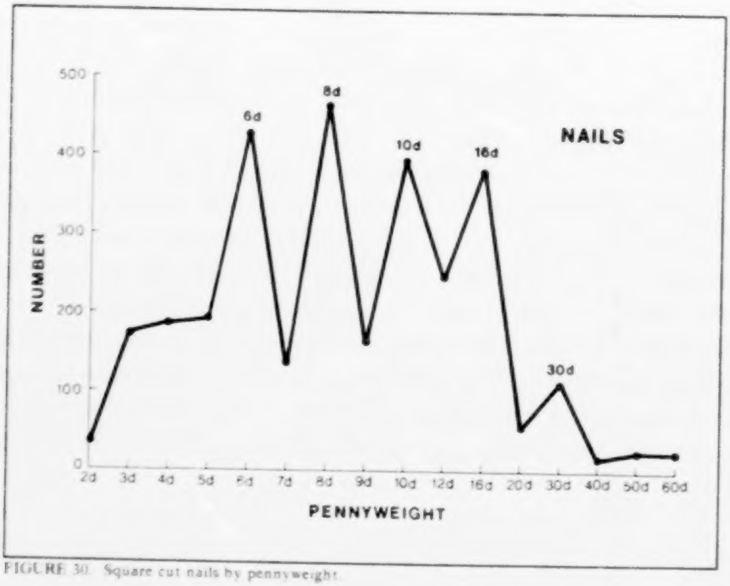

FIGURE 30. Square cut nails by pennyweight.

whitewashed. Moreover, mortar spill from fireplace construction superimposes this whitewash. Roofing slate was probably also a recycled item since it is highly unlikely that a small frame structure built beyond the fort walls would have received such an expensive and substantial roof. Slate seems to have been reserved for planned permanent buildings--the brick officers quarters and soldiers barracks within the fort walls. These structures burned in 1849 and 1865, respectively. Abundant construction material would have been available at both points in time.

6) What is the date of construction and occupation of laundress row?

The age of laundress row and feature 19 may be estimated from historic documentation. At two different times during the second fort occupation, references were made concerning the construction of temporary barracks. First, following burning of the soldiers barracks in 1849, Captain Arbuckle considered constructing temporary barracks with brick chimneys near the fort wall (Table 3). Abundant construction material was available in the burned soldiers barracks. Whether Arbuckle erected these structures can only be inferred from the documentation. When the Nineteenth Infantry garrisoned Fort Smith in 1868, housing again became a scarce commodity. It is known that two sets of company quarters were built at this time (Table 3). Abundant construction material was available in Officers Quarter B that had burned in 1865. A direct reference to construction of the quarters in laundress row, however, is unknown. Likewise, documentation of the abandonment and demolition of these buildings is non-existent. In all likelihood, laundress row was destroyed sometime between 1886-1889, when two railroads pushed through the military reservation (Table 3) where formerly, these barracks had stood. A more precise estimate of the age of the barracks in laundress row must be provided by diagnostic artifacts.

Artifacts are abundant in the buried historic ground level, notably surrounding feature 19, a fireplace foundation attributed to laundress row. Since artifacts are not contained in the builder's excavation for the fireplace, it may be inferred that most of these objects are associated with occupation of the structure and that feature 19 represents the first building constructed at this location. A number of diagnostic artifacts were recovered that may be used to refine the date of occupation (Table 19).

Many artifacts are temporally sensitive and can provide a general estimate of age. A marginal number of creamware and pearlware ceramic sherds are represented in the sample, but the majority of sherds are whitewares, manufactured after ca. 1830. Datable ceramic maker's marks cover a 28 year period from 1836-1864. Three coins were struck in 1838, 1841, and 1844, respectively. Metallic cartridges span the period of 1845-1882+. A cuff button bears a patent date of 1888, and five improved tooled crown bottle necks post-date 1892. These civilian artifacts hint that a lengthy occupation is represented. Yet, distinctly military objects indicate a more restricted time represented. Yet, distinctly military objects indicate a more restricted time period, at least for the military occupation.

Discounting the flashpan from a model 1816 U.S. musket and three buttons from the first fort occupation, nearly all accouterments and military buttons can be assigned to the decade of the 1850s and later. Thirty one buttons with the characteristic line eagle device adopted in 1855, were deposited after that date. Insignia are all of types adopted for use in the 1850s. Likewise, most bullets such as the Minie ball (1855-66) and Sharp's bullet (1852-66), and an official .50-70 goverment round produced after 1866, suggest occupation through the decade of the 1860s.

Window pane is a sensitive temporal marker and may be used to date feature 19 and laundress row. Window pane becomes progressively thick through time (Walker 1971:77-78) and since most glass is set in place at construction, may be used to determine a 'probable date of initial construction' (Schoen 1985:3). Excavation in the buried historic ground level produced 4,692 sheet glass or window pane fragments. This sample reflects a distinctive trimodality with higher frequencies of glass within the 1.3, 1.7, and 2.0 mm size classes (Figure 31).

Modal sheet glass thicknesses at Fort Smith may reflect distinct building or repair episodes of laundress row. Using Moir's (1982) predictive model for dating sheet glass, probable initial construction dates are assigned to the thickness modes in Figure 31. The sample reflects dates of 1823, 1855.4, and 1881.5, respectively. The highest modal glass frequency, assigned an 1855.4 date, is a likely candidate for the probable initial construction of feature 19 and laundress row. A small increase in sheet glass, assigned an 1823 date, falls within the period of the first Fort Smith, situated some 230 feet from the median strip. A small amount of this older glass is consistent with other evidence from this early military occupation. A few creamwares, pearlwares, and three military buttons from the first fort period were also recovered.

TABLE 19

Selected Diagnostic Artifacts from the Buried Historic Ground Level on the Railroad Median Strip

Ceramic Maker's Marks

1836 (1)
1844 (1)
1856 (1)
1842-51 (2)
1851-64 (1)
1851-55 (1)

Bullets

Minie Ball 1855-66 (7)
Sharp's Bullet 1852-66 (12)

Cartridges

.22 BB 1845-1945 (2)
.22 Short 1857+ (7)
.32 Short 1860-1920 (3)
.32 Long 1861+ (2)
.38 Long ca. 1865-1920s (2)
.44 Henry 1860-1934 (4)
.38-40 Winchester 1874+ (9)
.38 S&W 1877+ (1)
.32-20 Winchester 1882+ (1)
.50-70 Government 1866-70 (1)
.45-70 Government 1873-92 (2)

Accouterments

1851 Pattern General Service Insignia (1)
1858 Pattern Infantry Insignia (1)
1854 Pattern Shoulder Scale (1)
1858 Pattern Forage Cap Slide (2)
1851 Pattern Ordnance Insignia (1)

Improved Tool Crown Bottle Necks

1892+ (5)

Canning Jar Lid Liner

1869+ (1)

Shaving Soap Jar

ca. 1851-75 (1)

Military Buttons

1813-14 (1)
1812-17 (1)
1816-21 (1)
1833-61 (1)
1855-61 (1)
1860-68 (1)
1860s (5)
1852-77 (1)
1855-77 (1)
1855-84 (24)
1830-40 (1)
1820-39 (2)
1864+ (1)
1855-65 (4)
1855-59 (1)
1850-51 (1)

Coins

1838 (1)
1841 (1)
1844 (1)

Flashpan

1816 (1)

Cuff Button

1888 (1)

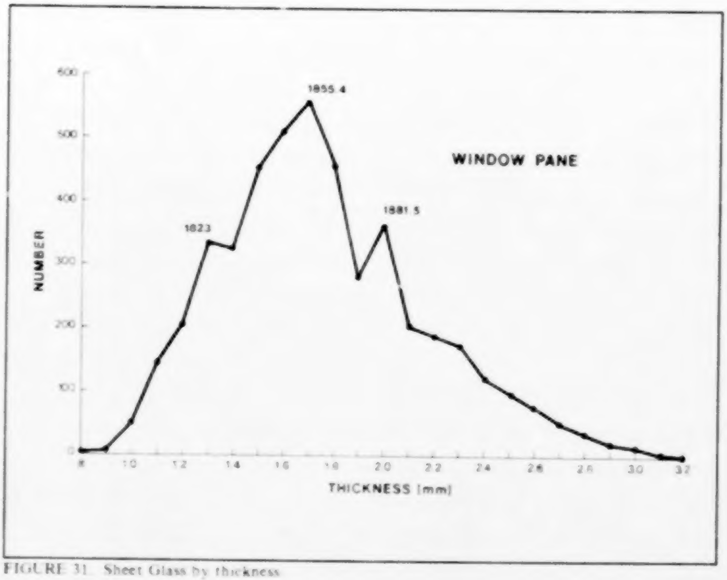

FIGURE 31. Sheet Glass by thickness

Because of the small numbers involved, however, these items probably do not indicate a first fort structure on the median strip. A small, but prominent increase in window pane, assigned an 1881.5 date, falls within the period of the Federal Court when civilians, probably court and prison employees, may have resided in these buildings. The small increase in glass of this period probably indicates repairs made to existing structures as does five round nails in the sample. It should be noted, however, that feature 23, located on the south end of the median strip, may be the footing trench of a post-military structure (Appendix 1).

Window pane from the buried historic ground level reflects three episodes of construction/repair that are surprisingly consistent with historic documentation. Each of three modal glass frequencies can be placed within known periods of site occupation. The highest modal frequency, believed to represent the construction of feature 19 and laundress row, is ascribed the date of 1855.4. It is promising that this hypothesized initial construction date is scarcely six years later than one historic reference to the erection of temporary barracks with brick chimneys (Table 3). Other techniques may be used to approximate the length of occupation.

To determine the age of feature 19 and laundress row, South's (1977:217) mean ceramic date formula will be employed. This statistic utilizes known manufacture ranges of ceramic types to establish mean dates. Mean dates are multiplied by the number of sherds for a given ceramic type. The product is summed and divided by the total sherd count to arrive at a mean ceramic date that approximates the median occupation date for a site or deposit. The occupation range for a site is determined by visual bracketing (South 1977:214). The technique creates a histogram of ceramic types by manufacture range. Brackets are placed to intertsect the end date of the earliest ceramic type and the beginning date of the latest type. Presumably, these visually placed brackets demarcate the historic occupation range.

South's formula has successfully computed dates for eighteenth century archeological sites, but has been less successful in dating nineteenth century remains. With recent refinements in the seriation of nineteenth century ceramics, however, several studies have produced viable results using South's formula (eg. Lofstrom et al. 1982; Miller 1971; Martin 1977; Esarey 1982; Coleman 1987b).

The ceramic seriation employed by Lofstrom et al. (1982), combined with chronological refinements presented in Chapter 5 of this report, has been used with South's formula to date the buried historic ground level. This calculation is based on sherd counts. Only ceramics on which glaze could be determined were used and only relatively large sherds without applied or molded decoration were classified as plain wares. Small unadorned sherds that could have originated from blank areas of decorated vessels were omitted (Table 20).

South's formula produced a mean ceramic date of 1845.6 (Table 21). Visual bracketing suggests a site occupation range from 1820-1880.

The mean ceramic date is 9.8 years earlier than the estimated initial construction date of feature 19 and laundress row. Several explanations may account for this disparity.

1) The calculation used sherd counts. Since later ironstone vessels can be expected to have suffered less breakage than older, softer earthenwares, the latter may be overrepresented. As prescribed by Lofstrom et al. (1982), using the minimum number of vessels may produce more reliable results.

2) The sample may incorporate a bias from the underestimation of late-dating plain and simply molded wares. When confronted with a collection of small sherds, these are less easily recognized than sherds with applied decoration.

3) The mean ceramic date calculation is based on the entire sample from the buried historic ground level. Although feature 19 and laundress row may represent initial construction at this location, artifacts from adjacent populations such as the civilian Belle Point community (eg. Coleman 1987b), may bias the sample.

4) The mean ceramic date may not accurately represent occupation at nineteenth century military sites. Soldiers acquired their own mess equipment for garrison use. This poorly understood aspect of military supply and acquisition may favor cheap as well as outdated wares.

Better controlled samples are required to determine the extent to which these problems have influenced the mean ceramic date computation. Unfortunately for this investigation, the buried historic ground level is a thin, unstratified deposit, with few artifact bearing features. Finer temporal control

TABLE 20

Ceramic Types and Manufacture Range

Obs	Decoration and Glaze	No	Date Range	Median
1	Annular (CW)	10	1775-1820	1798
2	Annular (PW)	6	1790-1830	1810
3	Annular (WW)	158	1830-1862	1846
4	Sponge/Spatter (PW)	7	1820-1830	1825
5	Sponge/Spatter (WW)	112	1830-1862	1846
6	Cut Sponge (WW)	6	1845-1862	1854
7	Sponge/Painted Sprig (WW)	2	1830-1862	1846
8	Cut Sponge/Painted Borderline (WW)	12	1845-1862	1854
9	Sponge/Molded (WW)	1	1830-1862	1846
10	Painted Blue Broad Floral (PW)	1	1810-1830	1820
11	Painted Blue Broad Floral (WW)	25	1830-1862	1846
12	Painted Poly. Broad Floral (PW)	1	1810-1830	1820
13	Painted Poly. Broad Floral (WW)	33	1830-1862	1846
14	Painted Poly. Sprig (PW)	8	1780-1830	1805
15	Painted Poly. Sprig (WW)	40	1830-1862	1846
16	Painted Borderline Only (PW)	5	1780-1830	1805
17	Painted Borderline Only (WW)	57	1830-1862	1846
18	Painted Vertical Line (PW)	5	1780-1830	1805
19	Painted Vertical Line (WW)	1	1830-1862	1846
20	Painted Indeterminate (PW)	5	1780-1830	1805
21	Painted Indeterminate (WW)	61	1830-1862	1846
22	Transfer Printed Blue (PW)	12	1790-1830	1810
23	Transfer Printed Blue (WW)	184	1830-1862	1846
24	Transfer Printed Lt. Blue (WW)	134	1830-1862	1846
25	Transfer Printed Black (WW)	20	1830-1850	1840
26	Transfer Printed Purple (WW)	19	1830-1862	1846
27	Transfer Printed Red (WW)	23	1830-1850	1840
28	Transfer Printed Green (WW)	12	1830-1850	1840
29	Transfer Printed Brown (WW)	23	1830-1850	1840
30	Transfer Printed Flown Blue (WW)	60	1845-1862	1854
31	Transfer Printed Green/Brown (WW)	1	1840-1850	1845
32	Transfer Printed Lt. Blue/ Green (WW)	1	1840-1850	1845
33	Transfer Printed Black/Red (WW)	1	1840-1850	1845
34	Transfer Printed/Painted Black (WW)	1	1840-1850	1845
35	Transfer Printed/Painted Blue (WW)	1	1840-1862	1851
36	Transfer Printed Blue/Molded (PW)	1	1790-1830	1810
37	Transfer Printed Blue/Molded (WW)	1	1830-1862	1846
38	Transfer Printed Purple/Flat Panel (WW)	1	1830-1855	1843
39	Transfer Printed Blue/Flat Panel (WW)	1	1830-1855	1843
40	Transfer Printed Flown Blue/ Flat Panel (WW)	1	1845-1855	1850

TABLE 20 (Cont'd.)

Ceramic Types and Manufacture Range

Obs	Decoration and Glaze	No	Date Range	Median
41	Transfer Printed Lt. Blue/ Flat Panel (WW)	4	1830-1855	1843
42	Transfer Printed Blue/Fluted (WW)	1	1840-1855	1848
43	Transfer Printed Lt. Blue/ Recessed Rim (WW)	1	1830-1862	1846
44	Transfer Printed Red/Molded (WW)	1	1830-1850	1840
45	Painted Broad Floral Poly./ Molded Boss (WW)	1	1830-1862	1846
46	Painted Broad Floral Poly./ Molded Floral (WW)	4	1855-1862	1859
47	Painted Gold Lustre Highlight/ Molded Floral (WW)	1	1855-1862	1859
48	Painted Sprig Poly./Molded Floral (WW)	1	1855-1862	1859
49	Painted Indeterminate Poly./ Molded Indeterminate (PW)	2	1780-1830	1805
50	Painted Indeterminate Poly./ Molded Indeterminate (WW)	2	1830-1862	1846
51	Molded Bead & Shell Edge Blue (WW)	2	1830-1862	1846
52	Molded Shell Edge Green (PW)	1	1800-1830	1815
53	Molded Shell Edge Green (WW)	9	1830-1862	1846
54	Molded Shell Edge Blue (PW)	10	1780-1830	1805
55	Molded Shell Edge Blue (WW)	104	1830-1862	1846
56	Molded Shell Edge Plain (WW)	3	1840-1880	1860
57	Molded Dot & Plume Blue (PW)	1	1800-1830	1815
58	Molded Bead (CW)	1	1775-1820	1798
59	Molded Bead (PW)	1	1780-1830	1805
60	Molded Scallop Plain (WW)	5	1856-1870	1863
61	Molded Recessed Rim Plain (WW)	11	1840-1880	1860
62	Molded Recessed Rim & Flat Panel (WW)	1	1840-1855	1847
63	Molded Recessed Rim/Fluted (PW)	1	ca. 1840	1840
64	Molded Recessed Rim/Fluted (WW)	2	1840-1855	1847
65	Molded Panel (PW)	2	ca. 1840	1840
66	Molded Panel (WW)	44	1840-1855	1847
67	Molded Fluted Panel (PW)	2	ca. 1840	1840
68	Molded Fluted Panel (WW)	11	1840-1855	1847
69	Molded Plain Ribbed (WW)	9	1863-1870	1867
70	Molded Plain Floral (WW)	8	1855-1870	1863
71	Molded Boss Edge Blue (WW)	2	1830-1862	1846
72	Molded Boss Edge Plain (WW)	3	1840-1880	1860
73	Molded Alphabet Edge Plain (WW)	2	1840-1880	1860
74	Molded Indeterminate Plain (PW)	4	ca. 1840	1840
75	Molded Indeterminate Plain (WW)	41	1840-1880	1860
76	Plain (WW)	24	1880-1894+	1887

TABLE 21

Mean Ceramic Date Computation

Ceramic Type	(xi) Type Median	(fi) Vessel Count	xi-1700	xi-1700xfi
1	1798	10	98	980
2	1810	6	110	660
3	1846	158	146	23068
4	1825	7	125	875
5	1846	112	146	16352
6	1854	6	154	924
7	1846	2	146	292
8	1854	12	154	1848
9	1846	1	146	146
10	1820	1	120	120
11	1846	25	146	3650
12	1820	1	120	120
13	1846	33	146	4818
14	1805	8	105	840
15	1846	40	146	5840
16	1805	5	105	525
17	1846	57	146	8322
18	1805	5	105	525
19	1846	1	146	146
20	1805	5	105	525
21	1846	61	146	8906
22	1810	12	110	1320
23	1846	184	146	26864
24	1846	134	146	19564
25	1840	20	140	2800
26	1846	19	146	2774
27	1840	23	140	3220
28	1840	12	140	1680
29	1840	23	140	3220
30	1854	60	154	9240
31	1845	1	145	145
32	1845	1	145	145
33	1845	1	145	145
34	1845	1	145	145
35	1851	1	151	151
36	1810	1	110	110
37	1846	1	146	146
38	1843	1	143	143
39	1843	1	143	143
40	1850	1	150	150
41	1843	4	143	572
42	1848	1	148	148
43	1846	1	146	146

TABLE 21 (Cont'd.)

Mean Ceramic Date Computation

Ceramic Type	(xi) Type Median	(fi) Vessel Count	xi-1700	xi-1700xfi
44	1840	1	140	140
45	1846	1	146	146
46	1859	4	159	636
47	1859	1	159	159
48	1859	1	159	159
49	1805	2	105	210
50	1846	2	146	292
51	1846	2	146	292
52	1815	1	115	115
53	1846	9	146	1314
54	1805	10	105	1050
55	1846	104	146	15184
56	1860	3	160	480
57	1815	1	115	115
58	1718	1	98	98
59	1805	1	105	105
60	1863	5	163	815
61	1860	11	160	1760
62	1847	1	147	147
63	1840	1	140	140
64	1847	2	147	294
65	1840	2	140	280
66	1847	44	147	6468
67	1840	2	140	280
68	1847	11	147	1617
69	1817	9	167	1503
70	1863	8	163	1304
71	1846	2	146	292
72	1860	3	160	480
73	1860	2	160	320
74	1840	4	140	560
75	1860	41	160	6560
76	1887	24	187	4488
		====		======
		1375		200256

$$MCD = \frac{\overset{n}{\underset{i = 1}{s}} \quad xi \times fi}{\overset{n}{\underset{i = 1}{s}} \quad fi} \qquad 200256 / 1375 + 1700 = 1845.6$$

Where s = sum

is not possible there.

Based on the initial construction date derived from window pane and the restricted time range of military artifacts, an 1855.4 construction date of feature 19 and laundress row is provisionally accepted. Military occupation of these facilities probably ended in 1871 upon abandonment of the fort. A postmilitary occupation is evident that may have persisted until ca. 1886-1889 when railroads were constructed at this location. Six crown bottle necks may indicate continued occupation on the median strip following 1892. After 1898/9, however, extensive fill deposits placed on the median sealed this occupational surface.

7) Can the documented function of laundress row be verified?

An 1870 map of Fort Smith refers to the line of buildings extending south of the fort wall as "laundress row." This historically assigned function may be tested against the archeological record.

Evidence indicates that feature 19, believed to represent one building in laundress row, was constructed by the military. The orange mortar used in the fireplace is typical of other second fort masonry. Furthermore, the nail profile in Figure 30 reflects a probable military pattern. Marked variation is evident with high nail frequencies occurring only at even pennyweight sizes for 6d through 30d nails. This same pattern has been archeologically verified at Fort Lancaster (Black 1975:164) and may be peculiar to military sites. Apparently, to simplify requisition, supply schedules favored even pennyweight nails. Lastly, the presence of small arms ordnance, accouterments, and military buttons in apparent association with feature 19 in test 36, section 5, and test 48 reveal a military occupation of the structure. Feature 19 was constructed by the military and, at least for one period in time, was used as a barracks. Other lines of evidence suggest possible multiple functions for the building.

The presence of combs, hairpins, jewelry, and hooks and eyes indicate a female presence. A small number of toys such as a miniature tea kettle, marbles, doll parts, and slate pencils reveal the presence of children. Women and children resided on the post as dependents of married soldiers or as laundresses and their offspring. Because of the inferred postmilitary occupation of the barracks, it may not be stated with certainty that laundresses resided there. Buttons, however, are abundant in the vicinity of feature 19 and may confirm the documented function of the structure.

By relying solely on military artifacts, it is possible to control for the contribution of the civilian occupation and to determine whether laundresses occupied feature 19. Laundering activity should result in an increased frequency of uniform buttons in the archeological record. To test this proposition, a simple index of small arms ordnance (round balls, Minie balls, Sharp's bullets, and metallic casings from government rounds) to uniform buttons will be created and compared to other military site barracks. It is assumed that the presence of small arms ordnance will be equally represented among all soldier's barracks. A higher ordnance/button index at Fort Smith could archeologically verify the presence of laundresses.

Ordnance/button indices were created for a Fort Towson barracks (Lewis 1972), and a Fort Washita barracks, hospital, bachelor officer's quarter, and a midden deposit (Lewis et al. 1975) for comparison to Fort Smith. These indicate indices of .118, .268, and .314 with the Fort Smith sample producing the highest frequency of uniform buttons relative to small arms ordnance. It appears that laundering activity is evident and that the historically documented function of laundress row can be confirmed.

8) What were the living conditions at laundress row and what influence did the military bureaucracy have on the lifestyle of the inhabitants?

The contribution of civilian occupants to the formation of the historic ground level can not be discounted. Yet, it is apparent that the military is also responsible for the deposit encountered there. Contents of the historic ground level include numerous military issue items from small arms ordnance-to-uniform buttons-to-accouterments. Furthermore, patterns evident in the recovered food bone seem to be consistent with military specifications for food preparation (Appendix 2). These data will be used to address research question 8.

The buried historic ground level on the median strip can be described as a sheet midden. Investigation there produced 16 artifacts for every square foot area excavated. Much of this material is kitchen related debris and contrasts to areas within the second fort wall where the few items recovered are predominantly architectural. The lack of residential debris there is ascribed to policing activity or a formal waste removal system within the fort interior. Conversely, the abundance of residential debris on the median strip, outside the garrison wall, indicates that the same waste removal system was not in effect there. The reason for this apparent difference is unclear, but may indicate that laundresses or the dependents of married soldiers were not subject to the same stringent regulations as troops stationed within the fort walls. More than likely, an "out of sight--out of mind" attitude prevailed among the succession of Fort Smith commandants who preferred to focus their limited resources and personnel on the upkeep of highly visible areas. In any event, both locations reflect different living conditions with extra-fort areas being noticeably unkempt.

The faunal analysis by Susan L. Scott and H. Edwin Jackson (Appendix 2) offers additional insights into living conditions and lifestyle of the laundress row inhabitants. Residential areas surrounding features 19 and 20 have the distinction of producing 79 of 80 total rat bones recovered. Interestingly, the same area produced the only cat remains from the project. The ubiquitous rat bones lead Scott and Jackson to describe the living conditions at laundress row as "squalid." The remaining compliment of bone, from food remains, reveals additional information regarding regulation food supplies, diet, and status.

Based on the specifications outlined in an 1861 military cookbook, Scott and Jackson determined that a military diet is apparent within the sample. In fact, the similarities are so striking as to suggest that these formal cooking instructions were "slavishly" adhered to (Appendix 2). Food bone reflects small, 3-4 pound cuts of meat and predepositional breakage suggests that bone was chopped-up for addition to soups and stews. Pork and beef provided the bulk of all meats consumed although sheep/goat, chicken, and turkey are also represented. Wild taxa supplemented this "military mess" and the bones of opossum, rabbit, raccoon, fox squirrel, white tailed deer; various species of waterfowl, turtle, and fish are evident. The use of game animals at military sites is not unusual. Hunting is a well documented activity among soldiers both for recreation and for supplementing an otherwise monotonous diet (Langellier and Laughlin 1984:3).

Artifacts from the buried historic ground level are indicative of the economic position or group status of the laundress row inhabitants. Food remains in the collection reflect more inexpensive cuts of meat such as chuck, foreshank, and picnic shoulder. Coupled with the comparatively poor living conditions created by the accumulation of kitchen debris in the yards surrounding these quarters, the occupants of laundress row can be considered a relatively low-status group. This is confirmed by the ceramic assemblage.

Ceramic tablewares reflect a range of quality and price, and are a good indication of group wealth (Miller 1980). To determine the relative status of the laundress row residents, a version of Miller's (1980) economic scale for nineteenth century ceramics, adapted for eastern Oklahoma sites (Lees and Kimery Lees 1984), was employed. For compatibility with other investigations, all sherds were included in the calculation. Small undecorated sherds were combined here with molded sherds having no applied decoration as a plain ware category (Table 22). A resulting economic rank of 1.4, compared to nine other east Oklahoma and Arkansas sites, is illustrative (Table 23). The buried historic ground level from Fort Smith ranks second to lowest among all sites considered. The Fort Smith sample is higher only than the Fort Washita hospital where, presumably, status was not a factor in the acquisition of tablewares. It should be noted that because of post-depositional breakage in a sheet midden, small plain sherds may be overrepresented. Since other lines of evidence also indicate a low-status group residing in laundress row, however, the results of the economic rank are provisionally accepted.

TABLE 22

Economic Ranking of Fort Smith Ceramics

(x) Ceramic Rank		(y) Sherd Count		x . y
1	.	5035	=	5035
2	.	435	=	870
3	.	284	=	852
4	.	511	=	2044
		6265		8801

$$\frac{s\ (x.y)}{s\ y} = \frac{8801}{6265} = 1.4$$

Where s = sum
y = number of sherds
x = ceramic rank
1) plain wares
2) minimally decorated wares (shell, sponge, annular)
3) handpainted
4) transfer printed

TABLE 23

Economic Indices of Fort Smith Historic Ground Level and Nine Arkansas and Eastern Oklahoma Sites*

Site	Function	Index
Fort Towson Sutler's Store	Store and Residence	1.72
Fort Towson Barracks	Military Barracks	1.77
Fort Washita Hospital	Military Hospital	1.31
Fort Washita North Parade Structure	Bachelor Officer's Quarter, Adjutant's Office, Schoolhouse	1.86
Posey Site	Trading Post and Residence	2.11
Vandever-Haworth Site	Trading Post and Residence	2.30
Fate-Roden site	Civilian Residence	1.90
Davidsonville	Civilian Townsite	2.19
Fort Smith Midden	Taverns and Civilian Residences	2.90
Fort Smith Historic Ground Level	Soldier's Barracks, Laundress Quarters, Civilian Residence	1.40

* After Lees and Kimery-Lees (1984:21). The data for Davidsonville is derived from Stewart-Abernathy (1980) and the information for Fort Smith Midden is from Coleman (1987b).

9) What is the extent of the prehistoric site on Belle Point?

Excavation within the buried historic ground level produced 328 prehistoric artifacts (Table 18). Their presence on the median area indicates that the prehistoric site on Belle Point (Dollar 1966) extends well to the east and perhaps occupied some or all of the second fort site. Historically, this area contained a prominent ridge that was cut away prior to second fort construction. Prehistoric flakes have been discovered in historic fill deposits from the second fort site (Coleman 1987:48). Occupation within the excavated area, however, does not appear to have been heavy. A total 2,775-square foot excavation within the buried historic ground level on the median strip produced only one prehistoric artifact for every 85 square feet excavated and concentrations in this area were not apparent. Prehistoric occupational debris, however, does appear to increase in density at the summit of Belle Point.

10) What cultural groups occupied the site and what is the length of occupation?

Although the number of prehistoric artifacts is small, it provides the only objectively collected sample of prehistoric artifacts from the park. Ten tested pebbles, 279 flakes and other bifacial reduction debris, four cores, nine preforms, 10 biface fragments, four projectile points, two scrapers, and a potsherd were recovered from the median strip. Five fragments of ground schist, one piece of ground steatite, and three burned clay lumps may also be associated with the prehistoric occupation. Two additional diagnostic artifacts from Belle Point, a projectile point and potsherd, are also considered here. These artifacts allow for an interpretation of prehistoric occupation at Fort Smith National Historic Site or at least that portion of the site on the median strip.

Diagnostic artifacts recovered indicate age and cultural affiliation of the site (Table 24). A single Jakie Stemmed point suggests an Early-to-Middle Archaic occupation sometime between 9,500-5,000 BP. Marshall and Gary projectile points were used from 6,000-1,000 BP. and from 7,000-1,000 BP., respectively, during the Late Archaic-to-Late Woodland periods. The Williams Plain sherd is a hallmark of the Gober complex, an Arkansas River variant of the Fourche Maline culture, ca. 1,650-1,050 BP. Williams Plain ceramics are usually affiliated with Gary points in Gober complex assemblages. An additional sherd from a shell tempered Woodward Plain vessel is typically Mississippian from 1,100-500 BP. Almost all of the diagnostic artifacts recovered here, excepting the Jakie Stemmed point, have overlapping time ranges and may have resulted from the same occupation, ca. 1,650-1,050 BP., by Gober complex peoples. Minimally, two components are evident. Without definite associations among the artifacts, however, it is not possible to further refine the various occupations present.

TABLE 24

Diagnostic Prehistoric Artifacts

Artifact Type	No	Affiliation	Date Range
Jakie Stemmed point	1	Early-Middle Archaic	9,500-5,000 BP
Table Rock Stemmed point	1	Late Archaic	5,000-3,000 BP
Marshall point	1	Late Archaic-Woodland	6,000-1,000 BP
Gary point	2	Late Archaic-Woodland	7,000-1,000 BP
Williams Plain sherd	1	Gober complex	1,650-1,050 BP
Woodward Plain	1	Mississippian	1,100-500 BP

11) What is the function or what functions are represented at the prehistoric Belle Point site?

The range of functional artifact classes recovered may indicate a semipermanent or seasonally occupied habitation site. Several activities are reflected. Projectile points and scrapers may indicate that hunting was an important economic activity and that carcass processing probably occurred at the site. Two flakes that exhibit use-wear may have been employed in scraping or cutting activities. Although direct evidence for horticulture was not encountered, a single argillite flake occurs in the sample. Typically used to fashion spades and hoes, argillite is one hallmark of Gober complex sites. Argillite hoe flakes and broken hoes were recovered during the early 1960s from Belle Point and are in the park collection. Thus, it is possible that a sedentary occupation and horticultural production is also represented. The presence of ceramics may also indicate an extended occupation, yet structural features such as hearths, pits, and house floors typical of permanent or semipermanent habitation were not identified. The best represented activity, however, is bifacial tool production.

A variety of lithic material is evident at the site, nearly all of which could have been acquired locally. Fifty two cortex bearing flakes indicate that rolled river gravels were the primary source of stone. These were probably gathered from gravel deposits in the adjacent Arkansas River. Two flakes in the collection, however, resemble Knife River chalcedony from North Dakota and are unmistakably exotic to the area. As would be expected of stone transported over great distances, these flakes do not exhibit cortex. The chalcedony, examples of ground schist and steatite, that are also nonlocal, suggest that site occupants participated in a panregional interaction sphere or trade network.

A complete lithic reduction sequence is evident at Fort Smith. For the most part, local gravels were selected and transported to the site without prior reduction. Tested pebbles, cores, and decortication flakes indicate that 85% of all stone was thermally altered prior to reduction. Chert nodules were then reduced by the opportunistic removal of flakes. To create a suitable striking platform for the subsequent removal of undesirable cortex, one or more ends of a nodule were first removed. Hard hammer percussion flaking was then further utilized to eliminate cortex and to generate interior flakes for tool production. Interior flakes were bifacially worked to prepare a platform for the subsequent removal of thinning flakes. The resulting blank was further modified through free-hand, soft hammer percussion flaking. The refined blank or preform was sharpened and notched with a hand held pressure flaker resulting in the production of tertiary flakes. Nine preforms occur in the sample. Five formally identifiable preforms are all ovate shaped.

CONCLUSION AND RECOMMENDATIONS

Archeological investigation of the pedestrian trail at Fort Smith provided a unique opportunity to test previously unexplored areas of the park. This work resulted in the identification of 67 archeological features and buried historic ground levels in two locations. A combination of avoidance and excavation were employed to mitigate construction impacts. Since the historic ground level on the median strip could not be completely avoided, however, a 2,775-square foot area was excavated, resulting in the acquisition of 43,906 artifacts. This significant sample spans the historic period at Fort Smith National Historic Site and was used to address 11 research questions.

Conclusion

1) How were areas beyond the garrison wall structured and used by occupants of the first Fort Smith?

Discovery of feature 77, a probable cellar or privy associated with the first fort occupation provides some information on the use of extrafort areas. Although feature 77 can not be associated with any known structure appearing on historic maps, it does confirm the presence of buildings outside the stockade wall. It is worthy to note the proximity and orientation of feature 77. It is only 50 feet from the stockade foundation and appears to exhibit a 25 degree variance from the first fort axis. The reasons for this observed pattern, however, are unclear and additional testing must be undertaken at feature 77.

2) How were areas beyond the garrison wall structured and used by occupants of the second Fort Smith?

The second fort exterior, at least on the present day median strip, was the subject of intensive use. Three distinctive use-areas encountered here include a stone dressing station/driveway for the Quartermaster Building (F25), a dumpsite for the post smithy (F72), and the site of a temporary barracks from laundress row (F19).

3) What differences exist between the use of space within and beyond the wall of the second Fort Smith?

Interior and exterior fort areas both contained barracks and should exhibit equal amounts of residential debris. Yet, differences are apparent. A paucity of artifacts within the garrison wall suggests that a formal waste removal system was in effect there. Areas beyond the garrison wall, however, were infrequently policed or not cleaned at all, allowing residential debris to accumulate and create an extensive sheet midden.

4) What is the location and orientation of laundress row?

The only surviving structural remains from laundress row is a fireplace foundation (F19) located in test 36, section 5 and in test 48 on the railroad median strip. The remaining four structures in laundress row, as depicted by the 1870 army survey map, have undoubtedly been destroyed by construction of the adjacent railroads. Feature 19 indicates that laundress row conformed to the axis of permanent buildings within the fort wall--40 degrees east-of-north. Evidently, the situation of the structures was formally determined by a surveyor.

5) How were the buildings in laundress row constructed?

Based on feature 19 and architectural artifacts recovered in adjacent test units, the laundress row buildings were simple two room, frame structures. Approximately 22x44 feet in dimension, these rested atop piers that may have been single stones placed at building corners. An increase in slate shingle fragments in the vicinity of feature 19 suggests that the quarters supported slate roofs. Numerous windows lighted the structures and building interiors were plastered and whitewashed. Rooms were heated by a double fireplace constructed of stone with a brick chimney shaft. These buildings were erected with recycled materials--probably borrowed from a burned structure elsewhere on the post.

6) What is the date of construction and occupation of laundress row?

Based on the initial construction date derived from window pane and the restricted time range of military artifacts recovered, an 1855.4 construction date of feature 19 and laundress row is provisionally accepted. Military occupation of these facilities probably ended in 1871, upon abandonment of the fort. A short post-military occupation is evident that probably ended about 1886-1889, when railroads were constructed at this location. The structure represented by feature 19 was certainly demolished before 1898/9 when fill was deposited on the median strip.

7) Can the documented function of laundress row be verified?

The 1870 army survey map reveals that a row of buildings south of the second fort wall housed laundresses. Military accouterments and small arms ordnance recovered in the vicinity of feature 19 suggest that initially, the structure served as a soldiers barracks. The presence of female and child specific articles here could have resulted from occupation by dependents of married soldiers or by post laundresses. An abundance of buttons from this area, however, supports the function ascribed to these structures in 1870. Feature 19 and adjacent structures were probably occupied by laundresses.

8) What were the living conditions at laundress row and what influence did the military bureaucracy have on the lifestyle of the inhabitants?

Military regulations played a primary role in the lives of laundress row residents and the composition of the archeological record. The best example of this bureaucratic influence is apparent in the faunal assemblage. Patterns evident in the recovered food bone seem to be consistent with military specifications for food preparation. Laundress row inhabitants consistently used 3-4 pound cuts of meat chopped-up for addition to soups and stews. The "military mess" at Fort Smith and elsewhere relied primarily on inexpensive cuts of pork and beef.

The economic condition of laundress row residents can be assessed on both intrasite and intersite levels. In each case, the occupants of laundress row appear to be a low-status economic group.

Compared to other areas of the second Fort Smith, the conditions at laundress row can be described as squalid. The historic ground level there is a sheet midden containing abundant kitchen debris. This contrasts to interior fort areas where more sterile and sanitary conditions prevailed. Presumably, waste was formally removed from the fort interior while garbage was allowed to accumulate in the barracks yards at laundress row. These extrafort residences have the dubious distinction of producing 79 of 80 rat bones recovered.

Compared to 11 eastern Oklahoma and Arkansas sites, the laundress row inhabitants exhibit a relatively low economic status. Ceramics are good indicators of consumer wealth. Since soldiers and other government employees supplied their own dinnerware for garrison use, ceramics are expected to mirror group status at Fort Smith. The Fort Smith sample ranked second to lowest among all 11 sites considered. Laundress row ranks higher only than the Fort Washita hospital where, presumably, status was not a factor in ceramic selection.

9) What is the extent of the prehistoric site on Belle Point?

The prehistoric site on Belle Point extends eastward to the median strip and presumably occupied much of the adjacent second fort site. This area was cut and filled between 1839-1846, but prehistoric artifacts occur in these historic fill deposits. Prehistoric remains, however, are most concentrated at the summit of Belle Point.

10) What cultural groups occupied the site and what is the length of occupation?

Diagnostic artifacts indicate that minimally, two prehistoric components are present. These include an Early-to-Middle Archaic occupation from ca. 9,500-5,000 B.P. and a late prehistoric Gober complex component from ca. 1,650-1,050 B.P.

11) What is the function or what functions are represented at the prehistoric Belle Point site?

Several activities are reflected here and probably indicate an extended occupation or a semisedentary habitation site, at least for the late prehistoric component. The presence of ceramics and agricultural tools suggest long term occupation, if only during warm weather months. Projectile points and scrapers reveal that hunting supplemented horticulture. Stone tool production is prominently represented. Site inhabitants exploited nearby riparian gravel deposits for raw material. Stone was transported to the site for reduction. The prehistoric occupants also participated in an extensive trade network as the recovery of Knife River chalcedony from North Dakota and soapstone from the southeast United States suggest.

Recommendations

Belle Point

The ground surface on Belle Point is uniformly disturbed to a depth of one foot and 95% of all artifacts derive from the twentieth century Coke Hill occupation of the site. Subsurface features with associated artifacts, however, do exist here. The discovery of a first fort cellar or privy (F77) establishes the presence of significant historic features beyond the walls of the first Fort Smith.

Feature 77 contains historic artifacts and excellently preserved bone that can yield valuable information on the early occupation at Belle Point. The structure is a significant resource at Fort Smith National Historic Site and must be preserved. To assist in future management desisions relative to feature 77, additional archeological testing should be conducted. The feature should be accurately delineated and mapped, and its depth and contents documented by test excavation. In the future, earth altering activity in the vicinity of feature 77 should be avoided.

All future work conducted on Belle Point must account for the potential presence of significant features. Additional historic structural remains probably occur in the area and the possibility for encountering prehistoric features like deep storage pits also exists. Although it is not considered feasible to screen soil or to collect all artifacts from the disturbed topsoil here, proposed impact areas must be thoroughly investigated for subsurface features. Significant features must be avoided. If avoidance is not possible, impact must be mitigated by total excavation.

Median Strip

The railroad median strip contains significant artifact bearing deposits and structural remains. A buried historic ground level is coextensive with the entire median strip area. This former occupational surface, from .6-3.5 feet below surface, contains abundant artifacts and features from the historic period at Fort Smith. Features 19 and 20, with associated sheet midden, represent laundress row, a line of temporary barracks constructed by the military. Feature 72 is a dumpsite from the blacksmith shop and feature 25 is a stone dressing station/driveway for the Quartermaster Building. These are significant archeological remains and as required by legislation, shall be protected. Future earth alteration that would impact the historic ground level on the median strip should be avoided. If avoidance is not possible, impact must be mitigated through data collection. All soil from the historic ground level should be screened and all artifacts must be retained.

Visitor Center Lawn

The visitor center lawn contains significant structural remains and buried deposits that must be protected. Portions of a former soldiers barracks (F78) survive on the visitor center lawn. This military structure is bisected by the 1888 prison addition. Thus, only narrow strips of the barracks basement survive. Feature 78 is a contributing park resource and should be preserved. Since the foundation of the prison addition is being slowly impacted by moisture, however, it is probable that future stabilization work will disturb the older barracks basement. An archeological investigation must precede any such work and should mitigate adverse effects through data collection. This excavation should accurately delimit the former barracks, determine methods of construction, and collect a quantitative sample of artifacts from the feature fill. These data will provide a representation of building materials and artifacts from the early construction period of the second fort. Because fill in the basement can be accurately dated, ceramic sherds and window pane glass collected there can be used to refine dating methods employing these sensitive temporal markers and are especially significant.

The visitor center lawn contains a buried historic ground level (zone 5) 1.4 foot below surface. This older occupational layer dates from ca. 1846-1888, and contains historic period artifacts. Since zone 5 overlies fill deposits resulting from early second fort construction, older artifact bearing layers may occur at greater depths, at least on the east half of the visitor center lawn. In 1986, monitoring for utility line insertion identified such a deposit on the southeast corner of the visitor center lawn, 3.25 feet below surface (Coleman 1987:24).

The potential for significant cultural remains on the visitor center lawn exists at any level. Late prison-related features may occur on the extant ground surface (zone 2). Second fort and early federal court remains undoubtedly occur in the buried historic ground level. Evidence of the early civilian community of Fort Smith and possibly prehistoric remains will be encountered at an unspecified depth below second fort fill (zone 6). If future earth altering activities on the visitor center lawn can not be avoided, impact must be mitigated through data collection. Proposed construction projects will be archeologically investigated to prevent impact to structures, features, and historic artifacts. All impacted areas of historic ground level should be systematically excavated. To acquire quantitatively viable samples, all soil from the historic ground level should be screened and all artifacts should be collected.

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APPENDIX 1
FEATURE DESCRIPTIONS

Archeological investigation for construction of the pedestrian trail resulted in the recognition of 73 subsurface features (Table 25). Both natural and cultural disturbances were identified. These are described below.

FEATURE 6

A probable post mold, feature 6 is a .5-foot diameter, circular stain in test 35, section 2 that originates .5 foot below surface (Fig. 32). Feature fill is a dark brown (10yr3/3) silt with tin flecks, coal, and amorphous iron inclusions. Feature 6 may align with two other post molds, features 8 and 9, and in the absence of structural remains, probably represents a former fenceline.

FEATURE 7

Feature 7 is a 3/4-inch diameter, iron stake with peened head and was obviously driven into the ground (Fig. 32). The top of the stake is encountered only .2 feet below extant ground surface. It appears to align due east/west with feature 47, another iron stake on Belle Point. Both stakes are probably markers or reference points and may relate to the 1904 survey of the West Fort Smith Addition.

FEATURE 8

Feature 8 is a probable post mold, apparently associated with two other post molds, features 6 and 9. The .6-foot diameter stain originates .5 foot below surface in test 35, section 3 (Fig. 32). Feature fill is a distinctive very dark greyish brown (10yr3/2) silt with cinder inclusions. In the absence of structural remains in the vicinity, feature 8 is probably associated with a fenceline.

FEATURE 9

A third post mold in apparent alignment with features 6 and 8, feature 9 is a .6-foot diameter, circular stain that originates .5 foot below surface in test 35, section 5 (Fig. 32). In appearance, the post mold is an easily recognized very dark greyish brown (10yr3/2) silt with cinder inclusions. Because of the apparent alignment with other posts and a lack of structural debris, feature 9 is probably a fencepost.

FEATURE 10 (AREA L)

Feature 10 originates .5 foot below surface in test 36, section 3 and test 42 (Fig. 32). In appearance, the feature is a 10-foot long, dendritic-shaped discoloration that at the widest point is 6.8 feet. At the narrowest point, feature 10 is only 1.5 feet wide. At surface level, fill is a homogenous red (2.5yr4/6) clayey sand. Coring indicates the presence of one underlying soil zone. From .6-.85 foot, soil is a dark yellowish brown (10yr4/4) silty clay. Feature 10 is .95 foot deep. A single plain whiteware sherd was located on the surface of the disturbance. Feature 10 is interpreted as an intentionally filled erosional cut from the twentieth century.

FEATURE 11 (AREA M)

A circular stain with a diffuse edge originates .5 foot below surface in test 36, sections 7-8 and in test 47 (Fig. 32). Feature 11 is approximately 6.0 feet in diameter and .85 foot deep. The fill is a homogenous, very dark greyish brown (10yr3/2) silt with dark yellowish brown mottles. Inclusions consist of fine sandstone chips, cinders, and brick flecks. Feature 11 is interpreted as a

TABLE 25

Archeological Features

No.	Location	Origin	Identification	Age
6	MS-1	C	Post Mold	Post-1898/9
7	MS-1	C	Iron Reference Stake	Post-1904
8	MS-1	C	Post Mold	Post-1898/9
9	MS-1	C	Post Mold	Post-1898/9
10	MS-1	N/C	Erosional Cut with Fill	Post-1898/9
11	MS-1	N	Tree Root	Post-1898/9
12	MS-1	N	Tree Root/Rodent Burrow	Post-1898/9
13	MS-1	N	Tree Root	Post-1898/9
14	MS-1	N/C	Erosional Cut with Fill	ca. 1930
15	MS-1	N/C	Erosional Cut with Fill	Post-1898/9
16	MS-1	N/C	Erosional Cut with Fill	Ca. 1930
17	MS-1	C	Refuse Midden	Post-1898/9-ca. 1930
18	MS-1	C	Post Mold	Post-1898/9
19	MS-2	C	Fireplace Foundation	ca. 1855-1898/9
20	MS-2	N/C	Tree Root with Fill	ca. 1830s-1840s
21	MS-2	C	Burned Structure	Pre-1898/9
22	MS-2	C	Footing Trench	Pre-1898/9
23	MS-2	C	Footing Trench	ca. 1880-1898/9
24	MS-2	C	Post Mold	Pre-1898/9
25	MS-2	C	Stone Dressing Station/ Quartermaster Drive	ca. 1839-1871
26	MS-2	N/C	Erosional Cut with Fill	Pre-1898/9
27	BP	C	Privy	20th Century
28	BP	C	Privy	20th Century
29	BP	C	Post Mold	Post-1904
30	BP	C	Post Mold	Post-1904
31	BP	C	Utility Line Trench	Post-1904
32	BP	C	Post Mold	20th Century
33	BP	C	Post Mold	20th Century
34	BP	C	Post Mold	20th Century
35	BP	N/C	Erosional Cut with Fill	1892-ca. 1915
36	BP	N	Tree Root	Unknown
37	BP	C	Privy	Post-1903
38	BP	N/C	Tree Root with Fill	Unknown
39	BP	C	Utility Line Trench	Post-1904
40	BP	N	Rodent Burrow	Post-1918
41	BP	C	Post Mold	Post-1918
42	BP	C	Post Mold	Post-1918
43	BP	C	Post Mold	Post-1918
44	BP	C	Post Mold	Post-1918
45	BP	N	Tree Root/Rodent Burrow	20th Century
46	BP	C	Post Mold	Unknown
47	BP	C	Iron Reference Stake	Post-1904

TABLE 25 (Cont'd.)

Archeological Features

No.	Location	Origin	Identification	Age
48	BP	N	Tree Root/Rodent Burrow	Unknown
49	BP	C	Post Mold	Unknown
50	BP	N	Rodent Burrow	Unknown
51	BP	C	Post Mold	Unknown
52	BP	C	Post Mold	20th Century
53	BP	C	Utility Line Trench	Post-1904
54	BP	C	Utility Line Trench	Post-1904
55	BP	C	Utility Line Trench	Post-1904
56	BP	N	Rodent Burrow	Unknown
57	BP	N/C	Brick Filled Depression	Unknown
58	BP	N/C	Brick Filled Depression	Unknown
59	BP	N	Rodent Burrow	20th Century
60	BP	C	Privy	Post-1903
61	BP	C	Post Mold	20th Century
62	BP	C	Utility Line	Post-1904
63	BP	C	Post Mold	Unknown
64	BP	C	Post Mold	Unknown
65	BP	N	Tree Root	Unknown
66	BP	C	Post Mold	Unknown
67	BP	N	Tree Root	Unknown
68	BP	C	Post Mold	Unknown
69	BP	C	Post Hole/Post	Unknown
70	BP	C	Post Mold	Post-1908
71	BP	C	Post Mold	Post-1903
72	MS-2	N/C	Erosional Cut and Fill	ca. 1839-1871
73	MS-2	C	Plaster Concentration	ca. 1898/9
74	MS-2	N	Erosional Cut	Pre-1898/9
75	MS-1&2	C	Post Hole or Pit	Post-1898/9
76	MS-2	C	Post Hole/Mold	Pre-1898/9
77	BP	C	Celler or Privy	ca. 1817-1824
78	VCL	C	Foundation and Basement	ca. 1840-1846

Origin
C=Cultural
N=Natural
N/C=Natural/Cultural

Location
MS-1=Median Strip, Upper Ground Level
MS-2=Median Strip, Historic Ground Level
BP=Belle Point
VCL=Visitor Center Lawn

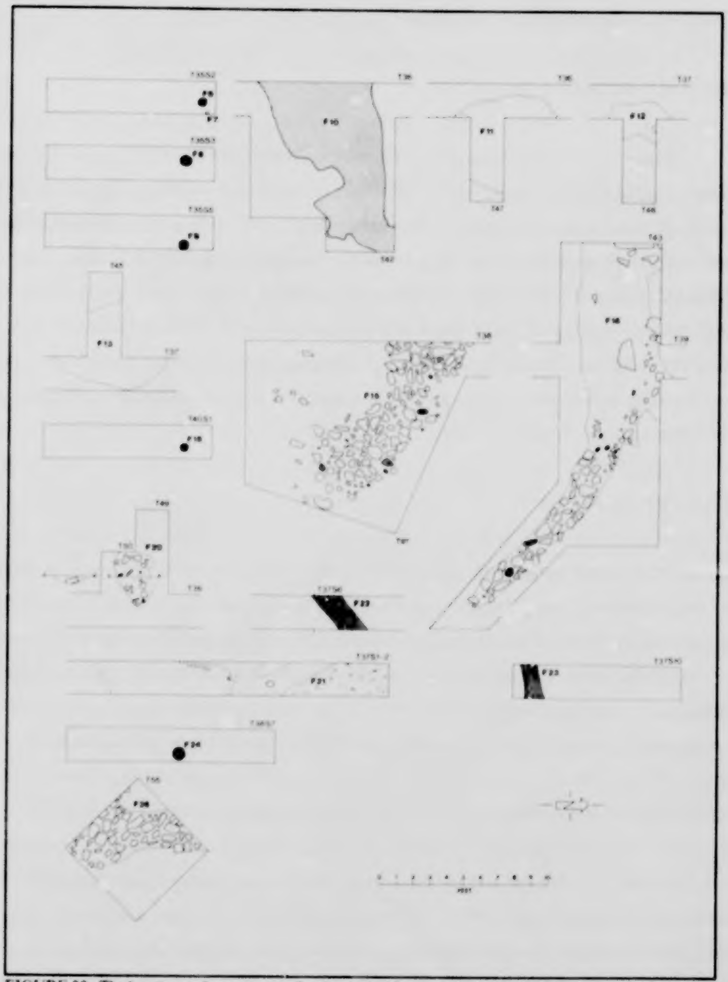

FIGURE 32. The location and appearance of archeological features encountered during testing on the median strip.

natural disturbance caused by a decayed tree root mass.

FEATURE 12 (AREA I)

Feature 12 is encountered .5 foot below surface in test 37, section 6 and appears as a circular stain with a diffuse, irregular boundary (Fig. 32). Test trench 46 was excavated perpendicular to test 37 to reveal another edge and confirm the shape of feature 12. Diameter is approximately 2.0 feet. Coring indicated a depth of 1.2 feet. Fill is a homogenous, very dark greyish brown (10yr 3/2) silt with abundant, dark yellowish brown (10yr4/4) mottles. Artifacts were not evident. Based on the diffuse, irregular edge and the presence of one distinct rodent tunnel intruding into the stain, feature 12 is interpreted as a tree root/rodent disturbance.

FEATURE 13 (AREA J)

Feature 13 originates .5 foot below surface in test 37, section 7 and test 45 (Fig. 32). It is a circular stain with diffuse edges, about 5.0 feet in diameter. At the surface of the disturbance, soil is a homogenous, very dark greyish brown (10yr3/2) silt with coal, cinders, hard white mortar, brick flecks, and sandstone inclusions. Coring revealed that feature 13 is 1.25 foot deep. Feature 13 is interpreted as a natural disturbance, probably a decayed tree root mass.

FEATURE 14 (AREA P)

A rubble concentration is encountered .5 foot below surface in test 38, sections 1-2 and test 41 (Fig. 32). The rubble is a shallow concentration of abundant sandstone, common brick, and orange colored second fort mortar. In shape, feature 14 is curvilinear, averages 4.0 feet wide, and is over 12.0 feet long. Fill between the rubble is a very dark brown (10yr2/2) silt. Feature 14 is interpreted as an erosional cut intentionally filled with historic debris following the ca. 1930 demolition of the Quartermaster Building.

FEATURE 15 (AREA O)

Feature 15 is a disturbance that originates .5 foot below surface in test 38, section 1 and test 41 (Fig. 32). In appearance, the feature is irregular in shape, over 9.0 feet long, and greater than 2.3 feet wide. Feature 15 widens near the edge of the median strip and so is probably erosional in nature. The fill is a dark brown (10yr3/3) silt. One stoneware sherd and a single purple transfer printed whiteware sherd were found on the surface of the disturbance. Feature 15 is an intentionally filled erosional cut dating to the twentieth century.

FEATURE 16 (AREA Q)

Feature 16 is observed .5 foot below surface in section 3 of test 39, in test 43, and in test 44 (Fig. 32). It is a dendritic-shaped erosional cut intentionally filled with historic period sandstone, brick, and mortar, presumably from the Quartermaster Building. This structure was razed about 1930. The cut is over 24.0 feet long, less than 1.0 foot wide at the point of origin, and over 4.7 feet wide at the edge of the median strip. On the surface, feature 16 is a very dark greyish brown (10yr3/2) silty clay. Coring indicated that at 1.8 foot deep, a red clay zone exists and at 2.1 feet below surface, a very dark greyish brown (10yr3/2) zone is found. Feature 16 is over 2.6 feet deep. Artifacts collected from the surface of feature 16 include plain whiteware, one flown blue transfer printed whiteware, two plain porcelain, and one orange-decal printed sherd; four stoneware vessel fragments, and one plain porcelain floor tile. Feature 16 is interpreted as a twentieth century erosional cut intentionally filled with historic debris from the Quartermaster Building after its destruction about 1930. This explanation can account for the mix of historic and recent artifacts from the surface of feature 16.

FEATURE 17 (AREA K)

Feature 17 is a dense midden identified in test 39, sections 7-8 and in test 40, section 5 (Fig. 33). Although the area was not accurately delimited by testing, the debris appears to be confined to a low area, roughly circular in shape, and at least 25x40 feet in diameter. The midden deposit, about 1.0 foot deep, is characteristically dark brown with a very heavy concentration of artifacts. Most of these are from a residential source and date to the early twentieth century. Important temporal markers include hand tooled patent/extract bottle necks (early 1870s-ca. 1915), glass with an amethyst tint (1880-1918), and early soda water bottles bearing the logo of the Fort Smith Steam Bottling Works. This company was established in 1899, scarcely 200 yards east of feature 17. Among the soda bottles are improved tooled "blob-top" bottles designed for use with the Hutchinson stopper, an improved tooled bottle neck for the pryoff cap (1892-ca. 1915), and an early machine made soda bottle neck (1903-present). One suspender buckle provided a patent date of March, 1911.

The midden probably accumulated soon after 1898/9, the date when the median received extensive fill deposits. In the early years of the twentieth century, the old Quartermaster Building became a multi-family residence and because of its close proximity to the midden, it is a likely candidate for the origin of this debris. The midden is capped by a heavy concentration of sandstone and characteristic orange colored second fort mortar. This debris probably originated from the destruction of this building around 1930. Thus, feature 17 can be dated to ca. 1898/9-1930.

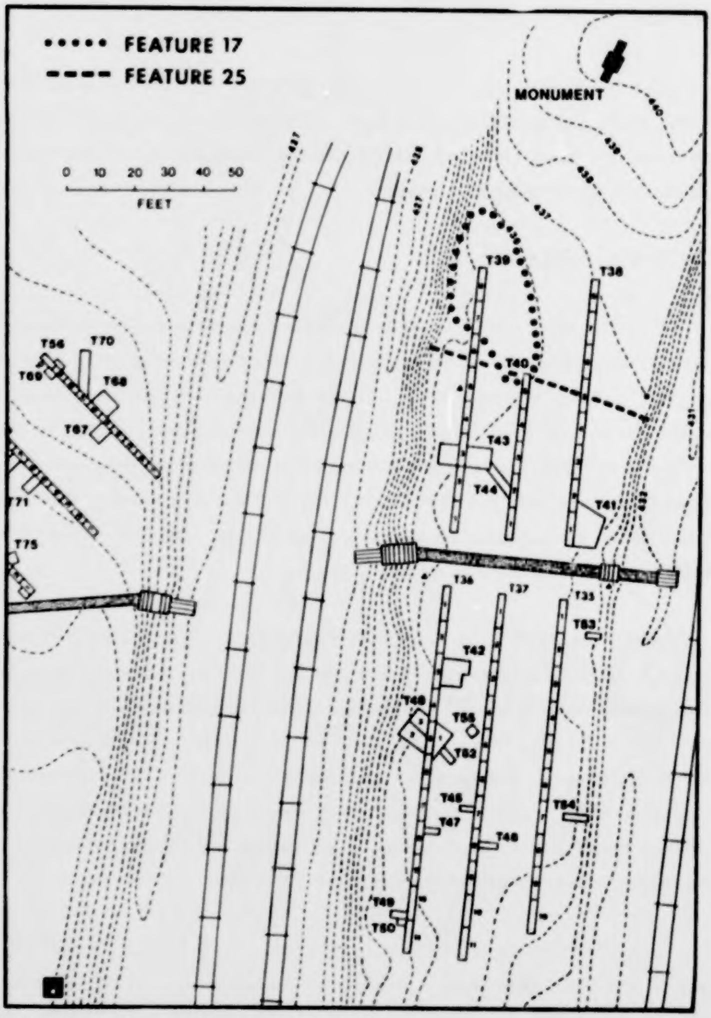

FIGURE 33. The location of feature 17 and feature 25.

FEATURE 18

Feature 18 is a probable post mold that appears .5 foot below surface in test 40, section 1 (Fig. 32). The post mold is a .5-foot diameter, circular feature that contains a black (10yr2/1) silt fill. In the absence of structural remains, feature 18 is interpreted as a fencepost.

FEATURE 19 (AREA V)

Feature 19 is the location of a former structure associated with the buried ground level in test 36, sections 4-6 and test 48 (Fig. 34). The only structural remains encountered consist of a fireplace foundation. Artifact distribution and differential soil compaction, however, indicate that building dimensions are approximately 22x44 feet. Since a continuous foundation is not present, it may be inferred that this structure rested atop piers placed at the corners. If the piers in question were single stones, once removed, little evidence would remain to indicate their former location.

The fireplace is an H-shaped foundation of undressed sandstone blocks cemented together with orange colored mortar. The fireplace measures 4.7x7.2 feet. At least three courses of stone remain intact and were set in a narrow builder's trench tailored to the size of the fireplace foundation. Mortar spill in the builder's trench indicates a trench width only .1 foot larger than the foundation itself. Brick fragments are abundant in the vicinity of the fireplace--many display intense burning on one face, indicating that they had been incorporated in a brick chimney shaft. Only the fireplace foundation was stone.

Abundant artifacts and structural remains reveal that feature 19 is a barracks affiliated with the military during the occupation of the second Fort Smith. A detailed discussion of the structure is presented in the report text.

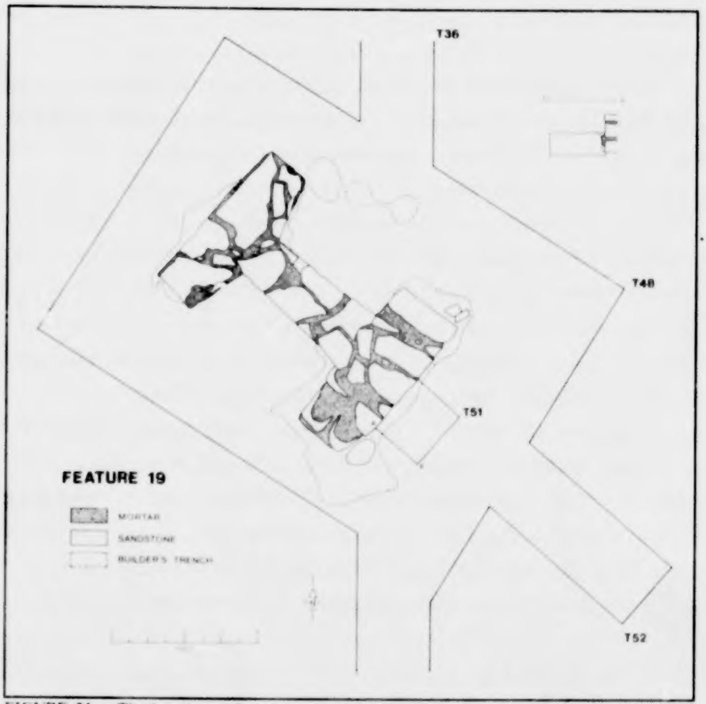

FIGURE 34. The location and appearance of feature 19, a fireplace foundation believed to represent the remains of a temporary, second fort barracks.

FEATURE 20 (AREA W)

Feature 20 occurs at the base of the historic ground level 3.1 feet below surface (Fig. 32). In appearance, it is an irregular, circular area with diffuse edges, about 2.5 feet in diameter. In cross-section, feature 20 is a shallow, .4-foot deep, basin-shaped depression. Fill is a homogenous, dark greyish brown (10yr3/2) silt with brick, charcoal, and mortar mottles. Feature 20 appears to be a natural disturbance caused by a decayed tree root mass but it is intentionally filled with historic period debris. Quantities of brick, orange colored mortar, sandstone, bone, window pane, nails, glass, and ceramics were found on the surface and in the excavated east half of feature 20. Feature 20 is interpreted as a naturally occurring depression intentionally filled with historic debris. The source of this debris was probably a nearby structure as nails, window pane, and slate frequencies all increase dramatically in the test units over feature 20. Several temporally diagnostic artifacts, including a pearlware sherd with an 1836 makers mark and a dragoon button of the 1830s to 1840s vintage, may indicate an early second fort structure. Unfortunately, this building was probably completely destroyed by the adjacent Missouri Pacific Railroad.

FEATURE 21 (AREA R)

Feature 21 originates at the base of the buried historic ground level 1.8 feet below surface in test 37, sections 1-2 (Fig. 32). The feature is a complex disturbance of charcoal and burned orange and black soil in a yellowish brown (10yr5/4) and dark greyish brown (10yr4/2) silt matrix. The area was not expanded upon with additional trenches but feature 21 most certainly originated from a burned structure. Discoloration in the soil here may represent the location of burned timbers. Other associated materials include fire reddened sandstone, 32 corn kernals and two cob fragments--all burned, and a large quantity of square cut nails. Nail pennyweights reflect a frame structure, perhaps with a shake shingle roof. Slate shingles and window pane, unlike other areas on the median, are noticeably few over the burned area. Feature 21 is interpreted as an outbuilding, probably for animal shelter, that burned. Since a foundation or other in-situ structural remains were not encountered, however, it is uncertain whether structural remains burned in place or were transported to this location and burned.

FEATURE 22 (AREA S)

Feature 22 is found at the base of the buried historic ground level 2.4 feet below surface (Fig. 32). It is a linear stain that represents a footing trench. Feature 22 is 1.3 feet wide and length is undetermined. Feature fill is a dark brown (10yr3/3) silt with commonly occurring mortar mottles. Brick fragments, while few, range in size from fine to large. Charcoal and some burned soil are associated with the area. Regarding artifacts, a noticeable increase in window pane glass and square cut nails occurs in the vicinity. Nail pennyweights indicate a frame structure. An orientation exactly 40 degrees east of north may suggest a second fort affiliation. Additional footing trenches or structural remains associated with feature 22 were not encountered and the size of the hypothesized structure is unknown. Probing indicated that in-situ stone was not present in the footing trench.

FEATURE 23 (AREA U)

Feature 23 originates near the top of the buried historic ground level, 4.4 feet below surface, in test 37, section 10 (Fig. 32). In appearance, feature 23 is a 1.0-foot wide, linear stain of undetermined length. The feature is oriented roughly east/west with a 10 degree declination to the north. Fill is a brown (10yr5/3) silt with a few brick mottles. Sherds of heavy white ironstone--cup, bowl, and bone dish fragments--of 1880s vintage were found on the surface of the feature. A noticeable increase in window pane and square cut nails appears in the surrounding area. Nail pennyweights indicate a frame structure. A slate roof may have existed on the building since slate increases noticeably in sections 7-9. Feature 23 is interpreted as a footing trench for a residential structure occupied in the 1880s. This may be a federal court related residence visible in a pre-1894 photograph (in the park collection) that shows a single room frame structure on the southern end of the median strip.

FEATURE 24

A probable post mold, feature 24 originates at the base of the historic ground level in test 38, section 7, 1.6 feet below surface (Fig. 32). The .7-foot diameter, circular feature contains a yellowish brown (10yr5/4) silt fill. In the absence of structural remains, feature 24 is interpreted as a post mold from a former fenceline.

FEATURE 25 (AREA T)

Feature 25 is an extensive, .2-foot thick deposit of angular sandstone found in test 38, sections 6-8 and in test 39, sections 6-8 (Fig. 33). The sandstone spalls range from small to medium size with the average size being about four inches in diameter. A 100% collection of sandstone spalls from a 2x2-foot square unit, section 8A of test 38, reveals that 433 stone chips weighing 2,410 grams exist per every square foot area of feature 25. Sandstone seem to increase in frequency toward the Quartermaster Building. Often, thin water deposited silt may be found between the stones, indicating that this surface remained exposed for a time at least. A few small lumps of orange colored second fort mortar are intermixed with the stone spalls but never does the mortar adhere to stone. Artifacts found overlying the sandstone deposit date from the second fort period and later. Feature 25 is probably an 1839 construction surface for the

Quartermaster Building. Angular sandstone chips are a biproduct of spot dressing stone by the masons. Since supply wagons loaded on the exterior of the Quartermaster Building, the stone concentration may also have served as a driveway through most of the second fort occupation by the military.

FEATURE 26 (AREA X)

Feature 26 is a dense concentration of broken brick, 2.3 feet below surface at the bottom of the historic ground level in test 55 (Fig. 32). The brick occurs in an irregular linear configuration that varies from 1-2 feet in width and, as probing indicates, over 12 feet in length. In cross section, feature 26 is a shallow v-shaped cut--probably erosional in nature. Heavy concentrations of slate shingle fragments, nails, and window glass indicate close proximity to feature 19. The erosional cut may have been filled with waste brick after demolition of the barracks.

FEATURE 27

Feature 27 originates 1.1 foot below surface in test 56, sections 3 and 4, and in test 67 (Fig. 35). In plan view, the feature is a large, rectangular-shaped stain with rounded corners that measures 2.5x4.0 feet. Probing indicates two distinct levels. First, a yellowish brown (10yr5/4) clayey silt with red (2.5yr5/4) clay mottles occurs from 0-1.3 feet. Second, a yellowish brown (10yr5/4) silt is found from 1.3-3.9 feet deep and is generally wet and uncompacted. This unconsolidated soil is probably in situ, decayed organic matter that was originally solid enough to support the fill in zone 1. The size and shape of feature 27 and the fill it contains indicate that it is a privy or outhouse. Moreover, the association of feature 27 with an upper topsoil suggests a recent age. An association with the twentieth century Coke Hill occupation of Belle Point is implied.

FEATURE 28

Another potential privy, feature 28, is located in test 56, section 5 and in test 68 only 2.0 feet from feature 27 (Fig. 35). The disturbance originates 1.2 feet below surface and is a large 2.8x3.8-foot rectangular stain. Feature 28 contains a brown to dark brown (10yr4/3) silty clay fill with red (2.5yr) clay mottles. Coring indicates the presence of a second zone from 1.0-2.9 feet deep. It is a dark grey (10yr3/1), unconsolidated silt. Coring could not determine the absolute depth of zone 2 or the feature. The size and shape of feature 28 indicates that it represents a privy or outhouse. Because zone 2 is unconsolidated and the surface of the feature produced a round wire nail, a recent age is indicated. It is suggested that feature 28 dates to the twentieth century Coke Hill occupation of Belle Point.

FEATURE 29

Feature 29 is a circular, .9-foot diameter stain that appears 1.1 foot below surface in test 56, section 7 (Fig. 35). The feature contains an easily distinguished, very dark greyish brown (10yr3/2) silt. One aluminum, screw-thread bottle cap collected from the feature surface indicates a twentieth century origin. Furthermore, feature 29 intrudes into feature 32, a utility line, and so postdates this feature. Utility lines were probably constructed on Belle Point after 1904, when the area was annexed by the city as the West Fort Smith Addition.

FEATURE 30

Another post mold, feature 30 intrudes into feature 31, a twentieth century utility line. The post mold originates 1.1 foot below surface in test 56, section 7 (Fig. 35). The .6-foot diameter, circular feature contains a very dark

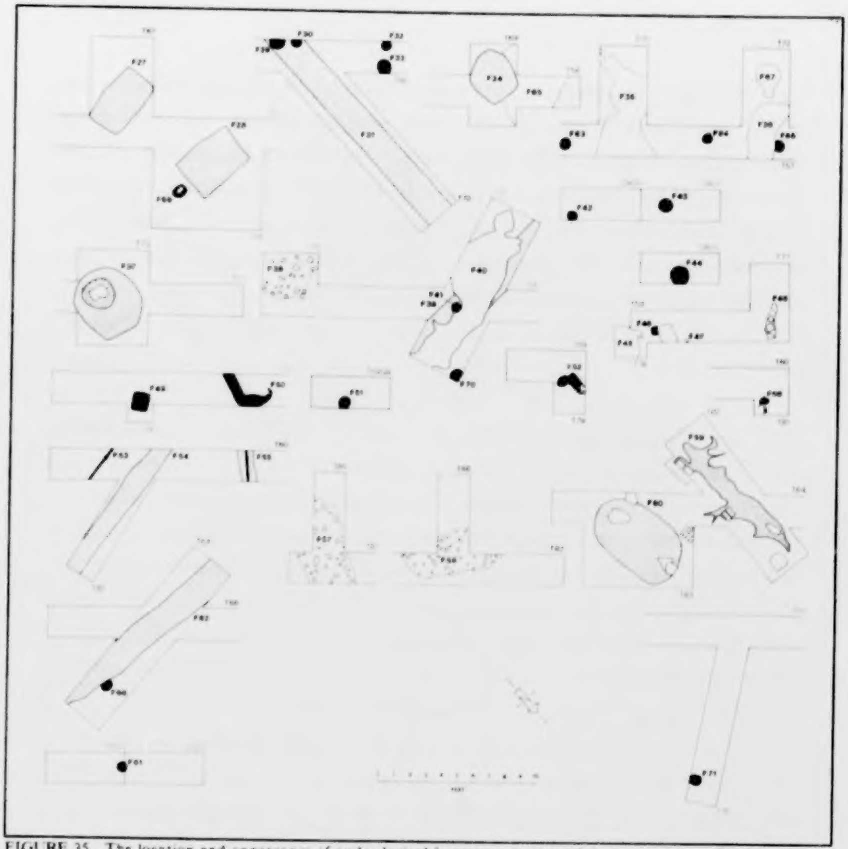

FIGURE 35. The location and appearance of archeological features encountered during testing on **Belle Point**.

greyish brown (10yr3/2) silt fill. Features 29 and 30 may be in alignment and in the absence of associated structural remains, probably represent a former fenceline.

FEATURE 31

Feature 31 is a 2.0-foot wide utility line trench exposed in test 56, section 7 and tests 57 and 70 (Fig. 35). The feature is oriented due north/south and aligns with an extant manhole cover, indicating that the trench contains a storm sewer. Feature 31 follows the axis of West Fort Smith and certainly postdates the 1904 annexation of this addition. The feature is encountered 1.1 foot below surface and contains a yellowish brown (10yr5/4) clayey silt. Coring could not establish depth of the trench or the storm sewer.

FEATURE 32

A .6-foot diameter, circular stain, feature 32 is probably a post mold (Fig. 35). The feature originates .9 foot below surface in test 56, section 7 and contains a very dark greyish brown (10yr3/2) silt. Artifacts are not present on the feature surface but it may align with either feature 29 or feature 30, both twentieth century post molds. In the absence of structural remains, feature 32 probably represents a former fencepost.

FEATURE 33

Feature 33, a .9-foot diameter, circular stain is probably a post mold (Fig. 35). The feature originates .9 foot below surface in test 56, section 7 and contains a very dark greyish brown (10yr3/2) silt. Artifacts are not evident at the surface of the feature but it may align with feature 29 or feature 30, both twentieth century post molds. Features 29, 30, 32, and 33 are all post molds that occur in an apparent alignment and probably represent a former fenceline.

FEATURE 34

Feature 34 occurs in test 56, sections 9-10 (Fig. 35). The roughly rectangular discoloration exhibits slightly rounded corners and measures 2.8x3.0 feet. The feature originates .7 foot below surface and coring indicates an overall depth of 2.3 feet. At least two fill episodes are evident. The first is a very dark grey (10yr3/1) silt. The second, from .6-2.3 feet, is a mottled tan and red clay. A spoon, clear glass, round nail, and a porcelain insulator fragment recovered from the feature surface attest to a twentieth century age. Feature 34 is probably a privy or outhouse affiliated with the Coke Hill occupation of Belle Point.

FEATURE 35

Located in test 71 at .7 foot below surface, feature 35 is a culturally filled erosional feature (Fig. 35). The dendritic shaped discoloration is 1.0 foot wide at the uphill end but gradually increases to 4.0 feet in width at the downhill end of the feature. Feature 35 contains a very dark greyish brown (10yr3/2) silt with brick and charcoal mottles. One nail of indeterminate form, two aqua colored bottle body sherds, and one crown bottle lip were identified at the surface of feature 35. The crown bottle lip exhibits an improved tool finish indicating that feature 35 postdates 1892.

FEATURE 36

Located in test 72, feature 36 is an irregularly shaped discoloration, 2.3x3.6 feet, with a diffuse boundary (Fig. 36). The feature contains a yellowish brown (10yr5/4) silt with ferrous concretions to a depth of at least .3 foot. Two largely nondiagnostic artifacts, a lead glazed stoneware sherd and a plain ironstone sherd, were identified on the feature surface. Feature 36 truncates a post mold, feature 66, and postdates that feature. Because of a diffuse, irregular boundary, and a paucity of artifacts, feature 36 is attributed to a natural disturbance such as a decayed tree root mass.

FEATURE 37

Feature 37, located in test 73, is a complex arrangement of two intruding disturbances (Fig. 35). The first is a rectangular-to-oval stain that measures 3.9x4.5 feet. Originating .8 foot below surface, the feature was probed to a depth of 2.6 feet. At least two levels are evident. The first is a very dark grey (10yr3/1) silt. The second level, from 1.0-2.6 feet deep, is identical to level 1 but is wet and uncompacted. It probably represents in situ decayed organic matter that was once solid enough to support zone 1. The shape and zonation of this first stain suggests that it is a privy. Moreover, the unconsolidated nature of zone 2 reflects a recent age as does the presence of wire nails and a machine made bottle. Feature 37A is probably a privy from the twentieth century Coke Hill occupation of Belle Point. The second disturbance, feature 37B, is a 2.0-foot diameter, circular feature that contains a yellowish brown (10yr5/4) silty clay. Feature 37B is a large post mold. Because it intrudes within feature 37A, it is also a twentieth century disturbance.

FEATURE 38

Feature 38 originates .7 foot below surface in test 58, section 1 and test 74 (Fig. 35). It is an irregularly shaped disturbance with a diffuse boundary and contains a brown-to-dark brown (10yr4/3) silt. Brick fragments are common in the feature fill and sandstone and bone are represented. Other artifact classes, including mortar, are noticeably absent. Coring indicates that feature 38 is a shallow, .5-foot deep depression. Because mortar is absent, feature 38 is probably not a construction related feature. Brick and sandstone in the feature fill may indicate production waste from on-site construction. Lastly, as a diffuse, irregular boundary may indicate, these objects are probably incorporated in a natural feature.

FEATURE 39

Located in test 58, section 3 and tests 59 and 75, feature 39 is a long, 2.0-foot wide trench with straight, parallel sides (Fig. 35). The trench follows a due east/west axis and so is probably a storm sewer or other utility line. Feature 39 contains a red (2.5yr) silty clay fill. Soil coloration indicates a deep excavation that encountered level B3 of Muskogee Silt Loam. A utility line would postdate 1904 when the West Fort Smith Addition was incorporated by the City of Fort Smith.

FEATURE 40

Feature 40 is an elongated, irregularly shaped disturbance that originates .9 foot below surface in test 58, section 3 and test 75 (Fig. 35). The very dark greyish brown (10yr3/2) silt stain ranges in width but is a maximum of 3.0 feet wide. Feature 40 is over 11.0 feet long. Coring indicates a shallow feature only .4 foot deep. Few artifacts occur in the feature fill but one plain ironstone sherd, one round nail, and one coke bottle sherd reflect a recent age. The coke bottle is the hobbleskirt pattern patented in 1918. Thus, feature 40 is late dating. The irregular shape of the feature and paucity of artifacts suggests that it is a natural disturbance--probably a rodent burrow.

FEATURE 41

A circular, .6 foot-diameter stain is located .9 foot below surface in test 58, section 3 (Fig. 35). Feature 41, a probable post mold, contains a very dark greyish brown (10yr3/2) silt and one brick fragment. The post mold intrudes into features 40 and 39 and as a result, feature 41 postdates 1918. Feature 41 represents a former fenceline and is probably associated with the Coke Hill occupation of Belle Point.

FEATURE 42

Feature 42, a .6-foot diameter, circular stain is recognizable at 1.0 foot below surface in test 58, section 6 (Fig. 35). Fill in the feature is a very dark greyish brown (10yr3/2) silt. A post mold is indicated. Feature 42 occurs in apparent alignment with features 40, 43, 44, and 70--all identified as post molds. Since feature 40 postdates 1918, feature 42 is probably of the same age. A fenced enclosure from the twentieth century Coke Hill occupation of Belle Point is indicated.

FEATURE 43

Encountered 1.0 foot below surface in section 7 of test 48, feature 43 is a .8-foot diameter, circular stain (Fig. 35). A post mold is indicated. The feature contains a very dark grey (10yr3/1) silt fill. Two white ironstone sherds collected from the feature surface are largely nondiagnostic. Feature 43, however, does occur in alignment with four other post molds: features 40, 42, 44, and 70. Feature 40 post dates 1918. Therefore, feature 43 probably represents a fenced enclosure associated with the twentieth century Coke Hill occupation of Belle Point.

FEATURE 44

Feature 44 is a 1.1-foot diameter, circular stain located .9 foot below surface in test 58, section 10 (Fig. 35). The shape of the stain suggests that it is a post mold. The feature contains a very dark grey (10yr3/1) silt. Feature 44 is possibly associated with four other post molds (features 40, 42, 44, and 70), one of which is known to postdate 1918. Therefore, feature 44 represents a former fenced enclosure and probably dates to the Coke Hill occupation of Belle Point.

FEATURE 45

Feature 45 is an irregularly shaped disturbance with a diffuse boundary identified .8 foot below surface in test 59, section 1 and test 76 (Fig. 35). The shallow, .1-foot deep disturbance contains a very dark greyish brown (10yr3/2) silt with common charcoal mottles and burned wood. One round nail, one white ironstone sherd, and undecayed wood were recovered from the feature surface. Feature 45 is interpreted as a burned tree stump. The round nail and undecayed wood indicate a recent age.

FEATURE 46

Located .8 foot below surface in test 59, section 1 and test 76, feature 46 is a circular, .5-foot diameter stain (Fig. 35). A post mold is indicated. The feature contains a dark brown (10yr3/3) silt. Artifacts were not recovered. Feature 46 represents a former enclosure and like several other circular post molds that are datable, is probably associated with the twentieth century Coke Hill occupation of Belle Point.

FEATURE 47

Feature 47 is a 3/4-inch diameter iron stake (Fig. 35) with peened head and is obviously driven into the ground. It is located .1 foot below surface in test 59, section 1 and appears to align due east/west with another iron stake on the railroad median strip. These features are apparently markers or reference points and may relate to the 1904 survey of the West Fort Smith Addition.

FEATURE 48

An irregular, linear concentration of brick and sandstone rocks occur .9 foot below surface in test 59, section 2 and test 77 (Fig. 35). Feature 48 is .6 foot wide, 2.3 feet long, and is contained entirely in a disturbed topsoil. This is a noncultural disturbance--possibly rubble that accumulated in a rodent burrow or tree root cavity.

FEATURE 49

Located 1.0 foot below surface in test 59, section 6 and test 78, feature 49 is a 1.0-foot square stain (Fig. 35). A post hole is indicated. The feature contains a dark brown (10yr3/3) silt with commonly occuring plaster or mortar mottles. Brick, slate, and a single gimlet pointed woodscrew are also present. These construction related artifacts may indicate that feature 49 is associated with a structure--perhaps as a building pier. The slate and brick affiliated with the post mold are typical of second fort construction debris and further indicate that feature 49 may be affiliated with an historic military structure. Associated post molds, however, were not located.

FEATURE 50

Feature 50, observed .7 foot below surface in test 59, section 9 is an irregular, 1-foot deep, curvilinear-shaped disturbance (Fig. 35). The .6-foot wide and 2.3-feet long feature contains a dark brown silt (10yr3/3) with bone, slate, and brick inclusions--all poorly represented. The shape of feature 50 is reminiscent of a natural disturbance such as a rodent burrow.

FEATURE 51

Identified .8 foot below surface in section 8 of test 59, feature 51 is a .7-foot diameter, circular stain (Fig. 35). A post mold is indicated. The feature contains an easily recognized dark brown (10yr3/3) silt with abundant cinders. Tin and bone flecks occur but are few in number. Feature 51 represents a former fenceline and like other circular post molds that are datable, is probably affiliated with the twentieth century Coke Hill occupation of Belle Point.

FEATURE 52

Feature 52 originates .7 foot below surface in test 59, section 10 and test 79 (Fig. 35). In appearance, the feature is an irregular, rectangular stain, .6x.8 feet, with a 3 1/4x3 1/2 inch post protruding from it. The badly decayed post may once have been larger. Feature 52 is definitely a post and post hole. A circular stain intruding into the southeast corner of the feature may be a second post hole or a natural disturbance. Brown bottle glass, one round nail, and one spark plug were recovered from the feature surface and indicate a twentieth century date. Feature 52 is interpreted as a post from a former enclosure and is associated with the Coke Hill occupation of Belle Point.

FEATURE 53

Feature 53 is a 3/4 inch iron utility pipe situated .3 foot below surface in test 60, sections 1-2 (Fig. 35). Because of the shallow depth of the pipe, an associated trench feature is not evident. Feature 53 probably postdates 1904, when the West Fort Smith Addition was incorporated by the City of Fort Smith. City utility services would not have been extended to Belle Point before that date.

FEATURE 54

Located in test 60, sections 1-2 and test 80B, feature 54 is a 1.2-foot wide trench that is over 9.2 feet long (Fig. 35). The feature originates .8 foot below surface and coring indicates that it extends .7 foot deep. Feature 54 contains a dark yellowish brown (10yr4/4) clayey silt with common brick mottles. Because feature 54 parallels feature 53, it is probably a contemporary utility line trench. The slightly irregular sides of the feature indicate that it was hand excavated. Like feature 53, the utility trench probably postdates 1904.

FEATURE 55

Feature 55 originates .8 foot below surface in test 60, section 3 and is a 1.0-foot wide trench oriented from northeast-to-southwest (Fig. 35). The feature contains a dark yellowish brown (10yr4/4) silt with a few brick mottles. The trench harbors a 3/4 inch iron utility pipe. Coring indicates that fill is only .2 foot deep. Thus, feature 55 represents the base of a utility line trench. The slightly irregular sides of the feature indicate a hand excavated trench. Like features 53 and 54, feature 55 will postdate 1904.

FEATURE 56

An irregular, .4x.5-foot diameter, circular stain, feature 56 originates .9 foot below surface in test 60, section 6 and in test 81 (Fig. 35). The feature contains a very dark grey (10yr3/1) silt fill. Feature 56 is probably a natural disturbance and two definite rodent burrows clearly intersect it.

FEATURE 57

Feature 57 is an irregular, oval-shaped disturbance encountered .8 foot below surface in test 61, section 5 and in test 85 (Fig. 35). The feature measures 3.5 feet wide, approximately 7.5 feet long, and was cored to a depth of .65 foot. Feature 57 contains two distinct soil zones. The first is a yellowish brown silt (10yr5/2) from 0-.5 foot deep and the second is a brown silt from .5-.65 foot deep. Artifacts were not found in the feature, but bricks comprise approximately 80% of the fill. In appearance, bricks are soft and orange colored, identical to the type produced locally for second fort construction. All bricks are broken, but measurements from two of the largest specimens fall within the range of historic bricks. One fragment is 2 6/16 inches thick and 4 11/16 inches wide. Another brick is 2 10/16 inches thick and 4 3/16 inches wide. The lack of whole bricks, mortar, and other construction debris indicates that bricks from feature 57 are not from a razed building. They are probably production wasters fortuitously discarded in a natural depression.

FEATURE 58

Located in test 62, sections 1-2 and test 86, feature 58 originates .8 foot below surface (Fig. 35). The feature is an irregular, oval-shaped disturbance that measures 2.5 feet wide, 6.0 feet long, and .5 foot deep. The feature contains two fill levels. The first, from 0-.4 foot, is a yellowish brown (10yr5/2) silt. Underlying this fill, from .4-.5 foot, is a brown colored silt. Brick fragments comprise about 80% of the fill in zone 1. Feature 58 is almost identical to feature 57 and is also interpreted as a natural depression intentionally filled with brick production wasters. The brick appears to be historic. An 1893 V nickel was recovered from the surface of feature 58.

FEATURE 59

Feature 59 originates .5 foot below surface in test 64, section 3 and test 82 (Fig. 35). The disturbance is a dendritic-shaped stain that measures 1.5 feet wide, 9.5 feet long, and .4 foot deep. The feature contains a very dark grey (10yr3/1) silt with artifact inclusions. One machine made bottle neck, one plastic comb, and a butter knife were recovered from the feature surface. Three makeshift building piers of brick and sandstone border the east edge of the disturbance. Feature 59 is a definite rodent burrow that was apparently situated beneath a Coke Hill shanty. Artifacts in the feature fill indicate a twentieth century date. Feature 59 and the adjacent structure were not investigated further.

FEATURE 60

Feature 60 is a 3.8x6.2 foot, rectangular-to-oval stain that appears .5 foot below surface in test 64, sections 4-5 and in test 83 (Fig. 35). The feature was cored to a depth of 1.3 foot, revealing a homogenous black (10yr2/1) silt fill. Tin, round nails, concrete, sandstone, and brick are all abundantly represented. One bathtub pull-chain, a machine made bottle top, bottle glass, and plain ironstone ceramic sherds were also recovered. The shape of feature 60 indicates a privy and the artifacts suggest a recent twentieth century age. The quantities of construction debris in the fill may reveal that the feature was filled when the Coke Hill shanty town was razed prior to National Park Service acquisition in 1961.

FEATURE 61

Observed in test 65, section 4 at .5 foot below surface, feature 61 is a circular, .6-foot diameter stain (Fig. 35). A post mold is indicated. The feature contains a very dark grey (10yr3/1) silt with coal and cinder inclusions. One piece of pressed glass and a round wire nail were recovered from the feature surface. The nail indicates a twentieth century age. Feature 61 is interpreted as a post mold from a former fenceline and is probably associated with the Coke

Hill occupation of Belle Point.

FEATURE 62

Feature 62 originates .9 foot below surface in test 66, section 4 and test 84 (Fig. 35). In appearance, the disturbance is shaped like a trench, is 1.8 feet wide, over 13 feet long, and is .5 foot deep. The slightly irregular sides of the trench suggest that it was hand excavated. Feature 62 contains a very dark grey (10yr3/1) silt fill. Machine-made glass, white ironstone sherds, and round nails were observed on the trench surface. A utility line is indicated. Feature 62 postdates 1904 when the West Fort Smith Addition was incorporated by the City of Fort Smith.

FEATURE 63

A .6-foot diameter, circular stain appears .7 foot below surface in test 57, section 5 (Fig. 35). Feature 63 is probably a post mold. The feature contains three soil types in basically equal proportions: a very dark greyish brown (10yr3/2) silt; a yellowish brown (10yr5/4) silt; and a red (2.5yr) silty clay. The different soils can only be explained by intentional filling of an empty post hole. Artifacts were not observed, but feature 63 is aligned with features 64 and 66--both post molds. Feature 63 probably represents a former fenceline and if contemporary with other dated round post molds, is probably associated with the Coke Hill occupation of Belle Point.

FEATURE 64

Feature 64 is a .55-foot diameter, circular stain encountered .9 foot below surface in test 37, section 6 (Fig. 35). A post mold is indicated. Feature fill is a very dark grey (10yr3/1) silt. Feature 64 aligns with two other post molds (features 63 and 66), however, and represents a former fenceline. Like other datable round post molds, feature 64 is probably a twentieth century disturbance.

FEATURE 65

Feature 65 is an irregular, circular stain encountered .6 foot below surface in test 56, section 10 and in test 69 (Fig. 35). The feature measures 4.5x5.0 feet and was cored to a depth of .6 foot. The boundary of feature 65 is diffuse and fill in the feature is composed of yellowish brown (10yr5/4) crotovina in a dark greyish brown (10yr4/2) matrix. This stain was probably caused by a decaying tree root mass. The absence of artifacts offers additional support for this noncultural assignment.

FEATURE 66

A .65-foot diameter, circular stain occurs .9 foot below surface in test 72 (Fig. 35). Feature 66 is probably a post mold. The feature contains a very dark grey (10yr3/1) silt with commonly occurring red (2.5yr) clay mottles. Artifacts were not recovered. Feature 66 aligns with two other post molds (features 63 and 64) and probably represents a former fenceline. Like other datable round post molds, feature 66 is probably a twentieth century disturbance.

FEATURE 67

Feature 67 is an irregular oval stain with diffuse boundary that appears .8 foot below surface in test 72 (Fig. 35). The disturbance measures 2.2x1.5 feet and was cored to a depth of .25 foot. The feature contains a very dark greyish brown (10yr3/2) silt and two sandstone rocks occur at the surface of the stain. Artifacts were not encountered. An irregular shape, diffuse boundary, and absence of artifacts indicate that feature 67 is a natural disturbance--probably a decayed tree root mass.

FEATURE 68

A .7 foot-diameter, circular stain originates .9 foot below surface in test 84 (Fig. 35). Feature 68 is probably a post mold. The feature contains a very dark grey (10yr3/1) silt fill. Feature 68 is truncated by a utility line trench (feature 62) and so predates the excavation of the trench. This post mold, in the absence of structural remains, probably represents a former fenced enclosure and like other datable round post molds, is from the twentieth century.

FEATURE 69

Feature 69 is a .8-foot diameter, circular stain encountered 1.3 feet below surface in test 68 (Fig. 35). Feature 69 is definitely a post hole as a wooden post, 3x6 inches, protrudes from the stain. Feature fill is a yellowish brown (10yr5/4) silty clay with red (2.5yr) clay mottles. Artifacts were not recovered but the presence of original fabric from a post indicates a recent age. Feature 69 represents a former fenced enclosure and probably dates to the twentieth century Coke Hill occupation of Belle Point.

FEATURE 70

Located in test 75 at .7 foot below surface, feature 70 is a .75-foot diameter, circular stain (Fig. 35) and is probably a post mold. The feature contains a very dark greyish brown (10yr3/2) silt fill. Artifacts were not observed. Feature 70 may be aligned with four additional post molds (feature 41, 42, 43, and 44). Feature 41 postdates 1918. Therefore, feature 70 is probably affiliated with the Coke Hill occupation of Belle Point.

FEATURE 71

Feature 71 is a .7-foot diameter, circular stain located in test 78 at 1.0 foot below surface (Fig. 35). A post mold is indicated. The feature contains a dark brown (10yr3/3) silt. One brown bottle base, one brown bottle body sherd, and one nail of undetermined form were recovered from the feature surface. The bottle base is machine made, indicating production after 1903. Feature 71 represents a former enclosure and dates to the twentieth century Coke Hill occupation of Belle Point.

FEATURE 72

Feature 72 is a large disturbance that occupies portions of eight different test units (Fig. 36). Identified at the base of historic ground level, the feature is encountered from 2.0 feet below datum in test B175 to 2.9 feet below datum in test B150. The dendritic-shaped disturbance is over 26 feet long and four feet wide at the widest point. Feature 72 widens and deepens as slope increases, indicating that it is an erosional cut. Depth varies from .5 foot-to-1.2 feet deep. Feature fill is a dark greyish brown (10yr4/2) silt and a light yellowish brown (10yr6/4) silt. The presence of two soil types such as these can be explained by intentional filling. This is substantiated by the presence of artifact inclusions.

Feature 72 contains common, large sandstone fragments and occasional charcoal mottles. Iron stock trimmings and production forms from a blacksmith shop are most abundant. Feature 72 is obviously the source of 1,154 blacksmith related artifacts recovered from overlying units during the investigation. In situ structural remains, however, are not associated with the feature. The nearest documented blacksmith shop, as depicted in Major Charles Thomas' 1840 map, was situated a short distance to the east and has been destroyed by the St. Louis

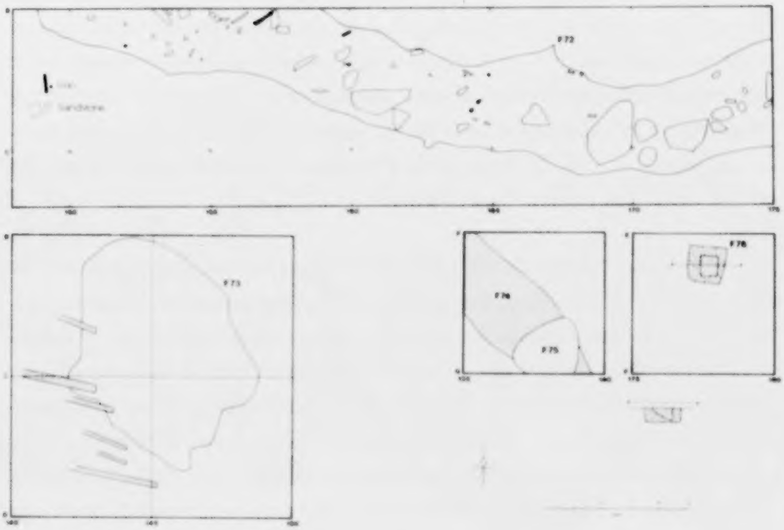

FIGURE 36. The appearance and location of archeological features encountered during excavation on the median strip.

and San Francisco Railroad. Feature 72 is interpreted as an erosional cut intentionally filled with debris from a blacksmith shop. Therefore, the deposit is secondary. An identical circumstance has been documented at the Marshall Powder Mill where iron trimmings were dumped in an erosional feature (Luke

1978:25).

FEATURE 73

Feature 73 is encountered 2.1 feet below datum in tests B150, B155, C150, and C155 (Fig. 36). It is an oval-shaped plaster concentration on the surface of the historic ground level. The feature measures 6x9 feet and is .6 foot thick. This dense concentration of beige and orange colored plaster could have originated from a historic structure of the second Fort Smith. Square nails, wire, an iron buckle, lead bullet, bone, and a .22 caliber cartridge shell were identified at the base of the plaster concentration.

Feature 73 is a secondary deposit of plaster unassociated with in-situ structural remains. Its presence on top of the historic ground surface reflects a late dumping episode--probably associated with repair or remodeling of a nearby historic structure. The Quartermaster Building, approximately 100 feet distant, contained both types of plaster identified in feature 73 and is a likely candidate.

The west edge of feature 73 is marked by six shallow scars that range from .1-.3 foot wide. These contain a dark reddish brown (2.5yr3/4) clay from the overlying fill. These scars probably represent a slip or similar device used to haul or dump the plaster in feature 73. Such scars were found nowhere else in the project area.

FEATURE 74

Identified 3.4 feet below datum in test F140, feature 74 is a shallow .5-inch deep, linear disturbance (Fig. 36). The feature is 2.4 feet wide, over 3.4 feet long, and exhibits a basin-shaped cross-section. Since feature 74 extends into the wall of the excavation area, overall length could not be ascertained.

Feature 74 is a naturally occurring erosional feature and artifacts were not present.

FEATURE 75

Feature 75 originates at the extant ground surface and intrudes into the historic ground level and feature 74 in test F140 (Fig. 36). The circular-shaped disturbance is 2.5 feet in diameter and contains a yellowish red (5yr4/6) silty clay. Feature 75 is probably a large post hole that postdates 1898/9, after fill was deposited on the railroad median.

FEATURE 76

Identified at the base of the historic ground level in test E180, feature 76 originates 2.0 feet below datum (Fig. 36). The 1.4-foot square feature is a post hole that contains a yellowish brown (10yr5/4) silt fill. A .6x.7-foot square post mold occurs within the post hole and is a dark brown (10yr3/3) silt. To determine post shape, feature 76 was cross-sectioned and removed in halfs. Apparently, only the lowest portion of the post survives and it is .45 foot deep. Iron flecks, bone, and nondiagnostic glass sherds were present in the feature fill. Shreds of wood survive in the mold, indicating that the post may have been excavated relatively late. Apparently, because other molds were not evident in the excavated area, feature 76 is an isolated post. Since associated structural remains were not encountered, feature 76 probably represents a fenced enclosure.

FEATURE 77

Feature 77 is probably a privy or the cellar for an outbuilding of the first Fort Smith. Four pier excavations for the pedestrian trail exhibit shelter revealed the edge of an historic structure on Belle Point (Fig. 37). Although the structure was not delineated in the field, it is greater than 15 feet long and seems to be oriented 74 degrees east of north or 25 degrees off of the first fort axis. The possible cellar is encountered 1.4 feet below surface, is greater than 3.1 feet deep, and contains artifact bearing fill.

At least two soil zones are evident in feature 77 and indicate as many fill episodes. Zone 1, from 1.4-2.4 feet below surface, is a brown-to-dark brown (10yr4/3) sandy loam with common, fine-to-medium size, red, sandy clay mottles. This level contains charcoal, ash, burned sandstone, brick, bone, and historic artifacts. Zone 2, from 2.4-3.1 feet below surface, is a light brownish grey (10yr6/2), ashy silt that contains charcoal, sandstone, and historic artifacts. Diagnostic artifacts in both zones indicate no appreciable difference in time of deposition.

Forty six artifacts were collected from feature 77. These include four kaolin pipe bowl and stem fragments; 23 ceramic tableware sherds; one unidentifiable tin fragment; four square nails; eight bone elements; one brick; one complete bottle; one bottle body sherd; and three prehistoric artifacts. Twenty ceramic sherds may be identified by glaze. Among these, 16 or 80% are pearlwares; three sherds or 15% are from creamwares; and only one sherd may possibly be identified as clear glazed whiteware. One sherd exhibits a Davenport maker's mark without the characteristic date over anchor. Fifteen ceramic sherds may be identified by design and include seven (47%) green shell edge sherds, two (13%) blue shell edge sherds, two (13%) slip banded mocha sherds; and four (27%) hand painted wares with sprig motif. Glass artifacts are represented only by one green wine bottle body sherd and one complete condiment bottle. The latter is an octagonal, wide-mouth bottle embossed "LONDON MUSTARD" and exhibits evidence of two piece mold construction with folded lip and blowpipe pontil scar.

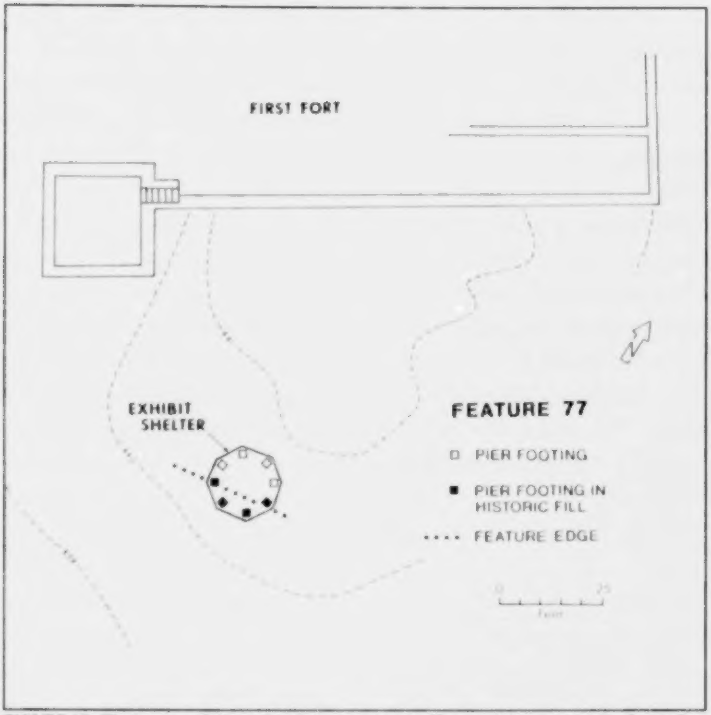

FIGURE 37 The location of the exhibit shelter and feature 77, a possible privy or cellar from a first fort structure

Diagnostic artifacts indicate a general date of deposition in the 1820s before the widespread appearance of clear glazed whitewares. Thus, feature 77 almost certainly dates to the first Fort Smith (1817-1824). One artifact of great interest is the brick recovered from zone 1 of feature 77. The first recorded manufacture of brick at Fort Smith was in 1839, for construction of the second fort. These characteristic bricks have typical dimensions of 8.25x4.25x2.25 inches. The incomplete brick recovered from feature 77, however, reveals distinctly different dimensions on at least two measurements--width is 4.09

inches and thickness is 3.0 inches. Overall, this brick is much larger and heavier than second fort specimens but exhibits an identical paste. Apparently, local brick production began during the first occupation of Fort Smith (1817-1824) and brick were probably used in the construction of the first fort and/or outlying buildings.

FEATURE 78

Archeological monitoring during construction of the pedestrian trail resulted in the identification of an historic structure associated with the second Fort Smith. A backhoe test excavated by the project contractor, here called test 31 (Fig. 4), exposed historic fill in the basement of Barracks B, 2.0 feet below surface. The foundation of the structure and the basement floor were encountered 4.7 feet below surface. Thus, overall depth of the basement excavation is 2.7 feet. The gallery or basement level porch is 3.5 feet below surface or 1.2 feet higher than the basement floor.

The barracks foundation is disturbed--a single course of stone remains. Original plans called for a 2.5 foot wide foundation, such as exists in the surviving soldiers barracks (Barracks A). The foundation in Barracks B, however, is only 2.0 feet wide, the interior edge of the footing having been removed. Apparently, Major Charles Thomas' order to retrieve construction stone from the foundation to construct the Quartermaster Building, was carried out to the letter. The builder's excavation on the exterior of the footing, at gallery level, is .5 foot wide. Test 31 was not large enough to verify the west edge of the gallery.

Three soil zones, representing as many fill episodes, occur in the Barracks B basement excavation. Zone 1, from 2.0-2.5 feet below surface, is a yellowish brown (10yr5/4) silt fill containing historic brick and slate shingle fragments.

Zone 2 is a dark yellowish brown (10yr4/4) silt that occurs from 2.5-3.4 feet below surface. Orange colored mortar and white colored plaster are common in zone 2. Window pane glass, slate shingle fragments, and brick are less frequently represented. A thin, discontinuous band of water deposited silt separates zones 2 and 3, indicating that the barracks basement remained open for a short time. Zone 3, from 3.4-4.7 feet below surface, is a dense concentration of construction rubble with a matrix identical to zone 2. Zone 3 contains quantities of brick, sandstone, slate shingle fragments, orange colored mortar, and white colored plaster. Bricks have mortar adhering to their surfaces--both orange and beige colored--that is identical to historic mortars used elsewhere on the site. Apparently, Thomas' work on Barracks B may have progressed to setting the brick walls of the building and/or the floors. This explanation would account for the quantity of brick in zone 3.

APPENDIX 2

ANALYSIS OF FAUNAL REMAINS FROM THE 1985-88 FORT SMITH PEDESTRIAN WALKWAY EXCAVATIONS

A Report Prepared for the
National Park Service and the
Fort Smith National Historic Site

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TABLE OF CONTENTS

INTRODUCTION 330

BACKGROUND 330

THE FAUNAL SAMPLE 331

MATERIALS AND METHODS 333

THE ANALYSIS 337

  Intersite Patterning 339

  Intrasite Patterning 342

  Butchering Patterns 345

SUMMARY 348

REFERENCES CITED 352

APPENDIX: Inventory of Faunal Remains from Fort Smith Pedestrian Walkway Excavations MF.12

LIST OF TABLES

TABLE 1. Excavation Units Associated with Concentrations of Bone from the Fort Smith Pedestrian Walkway Excavations 332

TABLE 2. Common and Scientific Names of Species Identified in the Fort Smith Pedestrian Walkway Excavations 338

TABLE 3. Counts (NISP) of Bone from the Fort Smith Pedestrian Walkway Excavations 340

TABLE 4. Minimum Numbers of Individuals for Samples of Bone from the Fort Smith Pedestrian Walkway Excavations 341

TABLE 5. Comparison of Relative Frequencies of Taxonomic Groups at Fort Smith and Fort Washita 342

TABLE 6. Relative Frequencies of Taxonomic Groups in Samples of Bone from the Fort Smith Pedestrian Walkway Excavations 343

TABLE 7. Numbers of Identified Specimens (NISP) by Butchering Unit for Cow and Very Large Mammal Fragments, and for Deer, Sheep/Goat, Pig and Large Mammal Fragments 346

TABLE 8. Minimum Numbers of Butchering Units for Cuts of Beef and Pork in Bone Concentrations from the Fort Smith Pedestrian Walkway Excavations 349

LIST OF FIGURES

FIGURE 1. Butchering Units of Beef Ranked As to Relative Value 347

INTRODUCTION

Excavations in the vicinity of a proposed pedestrian walkway at the Fort Smith National Historic Site, conducted between 1985 and 1988, encountered undisturbed sheet midden deposits created during the course of the 19th Century occupation of the fort. These deposits were sealed by a thick layer of fill dating to 1897 (Coleman 1987). Along with material cultural remains, a substantial sample of faunal material was recovered. Analysis and interpretation of the nearly 4000 bone fragments comprising this sample provides the basis for examining aspects of 19th Century military provisioning, which is the subject of this report.

BACKGROUND

The military occupation of Belle Point began in late 1817, when Arkansas was still largely a wilderness teeming with wildlife, and ended in 1871 when Fort Smith clearly was no longer sufficiently close to the United States frontier to serve as a provisioning center. During this time period, the area surrounding the fort changed considerably, evolving from Indian-occupied prairie and forest to bustling town and productive farmland.

Written accounts indicate that during the earliest part of the fort's history, the men stationed there were expected to meet most of their subsistence needs by hunting, raising livestock, and farming (Bearss and Gibson 1969:36). Their efforts were supplemented by Indians and local settlers who infrequently supplied the troops with "fresh beef" and pork. Judging from most written accounts, however, the customary army ration of beans and salt pork remained the staple throughout much of the fort's early history. Subsistence supplies not procured by the soldiers were shipped to the fort via the Arkansas River from New Orleans, or supplied on contract by local citizens. Eventually, the burden was shifted from long-distance to predominately local supply, culminating with the suggestion of Captain Alexander Montgomery that local contractors could supply the food necessary to sustain all of the forts on the frontier provisioned via Fort Smith as a military depot by ca. 1850 (Bearss and Gibson 1969:229).

Several years after the fort's founding, game had become sufficiently scarce in the surrounding area that the commanding officer (William Bradford) wrote "that it was impracticable to rely on rations of meat from the nearby woods" (Bearss and Gibson:36). Shortly thereafter, around 1822, additional land was acquired to pasture increased numbers of cattle and hogs, estimated to have been 100 and 800 head respectively (Bearss and Gibson 1969:57-58). Sheep also may have been raised by soldiers stationed at the fort. A letter written by Lieutenant Martin Scott accused the post commander (Bradford) of keeping various subsistence and luxury items, including sheep, for his own personal use (Bearss and Gibson 1969:72-73). Bradford was found innocent of the charges, and sheep are not mentioned in any other documents. Considering the source, the presence of sheep during the early part of the fort's occupation may be called into question.

Aside from periodic requisitions for additional salt pork to make up shortfalls experienced due to harsh winters or to feed a temporarily increased fort population, we know very little about subsistence during the course of the Fort Smith occupation. Hence, it is hoped that the following analysis of faunal remains from middens located outside the walls of the "second fort", will shed somewhat more light on the kinds and quantities of meat consumed by the soldiers residing there.

THE FAUNAL SAMPLE

During the course of the 1985-88 excavations at the Fort Smith National Historic Site, some 3,796 fragments of bone, shell and eggshell were recovered from 113 horizontally separated excavation units. Three concentrations of bone were isolated during analysis. The majority of bone from the site was recovered from excavation units in the general vicinity of "Area V", interpreted as the remains of a substantial structure, presumably a temporary barracks for soldiers stationed at the fort (Coleman 1987:18-22). Artifactual remains in the vicinity of this structure suggest it was used both as military barracks beginning perhaps in 1849, and eventually as a domicile for the company laundresses and their offspring. A second large sample of bone was found in the vicinity of Area W, a refuse filled depression located just to the south of Area V. The third concentration of bone, "Cluster 3", was isolated in the western half of the excavation units located along the proposed route of the pedestrian trail, and is not associated with any discernable archaeological feature. A list of the provenience units associated with each of these samples of bone can be found in Table 1. It should be noted that the bone samples here assumed to be associated with Areas V and W extend over much larger areas than the actual archaeological features per se.

TABLE 1: Excavation Units Associated with Concentrations of Bone from the Fort Smith Pedestrian Walkway Excavations

Concentration	Provenience
Cluster 1 (Area V)	Trench 36, Sections 4,5,6,7, and 48 Trench 37, Sections 4,5,6,7, and 8 Trench 48, Sections 1,2, and 3 Trench 51 Trench 52 Trench 55
Cluster 2 (Area W)	Trench 36, Sections 9, and 10 Trench 37, Sections 9, and 10 Trench 49 Trench 50 Area W, and Area W, East half
Cluster 3	Excavation Units B 130, 135, 140, 175 C 130, 135, 140, 145 D 130, 135, 140, 145, 150 E 130 F 130, 135, 140

Bone preservation at the site was variable, but generally relatively poor. Most of the bone exhibited evidence of leaching, and many fragments suffered recent breaks either during excavation or shipment due to their friable condition. Had these fragments remained in the ground another hundred years or so, it is unlikely that any bone assemblage would have been recovered from the site.

The high degree of bone fragmentation observed in the sample can be partially explained by the poor condition of the bones, but it is also likely that their vulnerable location in what might best be described as "sheet midden" deposits contributed to the breakage. Repeated trampling by both humans and livestock undoubtedly broke up numerous bones before the site was covered by a thick layer of fill at the end of the 19th century. It is also possible that some of the larger elements were broken up to boil for broth after the initial meatcut was consumed, rendering them unidentifiable osteologically as well as literally.

Two classes of faunal materials identified in the sample only by presence/absence and not dealt with further in this report are mussels and eggshell. Both were encountered only as tiny fragments, and could not be identified more specifically. At least three species of mussel are assumed to have been present since shells of three different thicknesses were noted in the assemblage.

MATERIALS AND METHODS

Faunal materials from the site were identified using comparative materials from the author's personal collection, specimens from the University of Southern Mississippi, and specimens from the University of Georgia. Dr Elizabeth Reitz of the University of Georgia kindly assisted in the identification of several problematical pieces.

Twelve variables were coded directly into a computer databank for each fragment of bone or shell. Coded variables include Provenience, Identification, Element, Symmetry, Fusion, Fragment size (a subjective estimate of the size of a fragment in relation to a complete element), Fragmentation (four variables describing the fragment in relation to a complete bone), Modification, and Meatcut. Most of these categories are self- explanatory, but a few require more detailed information for complete understanding. The entire databank can be found as an Appendix to this report.

The category "Identification" includes variables for bone not identifiable to the family, genus , or species level, such as large mammal, large bird, etc. Bone coded as very large mammal refers to fragments in the size range of cow and bison, large mammal indicates a deer-sized individual, medium and small mammal refer to animals larger than rabbits, and rabbit-sized or smaller, respectively. Fragments coded as small, medium, and large bird indicate individuals smaller than a crow, those approximately the size of a duck, and those the size of a turkey.

The "Element" category included equally general variables for describing bones not identifiable at least to the level of family, including skull, long bone, and indeterminate fragments. The latter designation refers to irregularly shaped bone fragments whose surface texture or internal structure indicate in a general way the class and size of the individual from which it derived, but give no further clues as to the kind of element it represents. Most of these fragments probably are the thoroughly fragmented remains of vertebrae or articular ends of long bones.

The category for "Fusion" includes variables to describe any osteological indicator of age, the most familiar of which is the fusion of the ends or epiphyses of long bones to the shaft of the bone at a certain point in maturation. Identified teeth are described as deciduous or adult, and in a few cases are described as not yet erupted. Finally, a variable for designating a bone as originating from an immature animal, indicated by porous bone structure, can be found in this category.

The categories for "Modification" and "Meatcut" describe alterations to the bone resulting from the activities of man or animal. Variables coded under modification include saw marks, fillet marks (knife scratches resulting from removal of meat from the bone), burning, and rodent and carnivore (dog) gnawing. Meatcut was recorded only when it was clear from the butchering marks on an identifiable element exactly how an animal had been cut up. If unambiguous butchering marks were not present, as was true for most of the sample, the cut of meat represented was coded as indeterminate, even if the probable cut of meat represented was known. For example, if a proximal humerus identifiable as cow was present but was not butchered, Meatcut was coded indeterminate even though it represented the chuck portion of a side of beef. If saw marks were located along the shaft of the bone, Meatcut was coded as "chuck", since it clearly was part of that specific butchering unit. The very general variable "steak/chop" was included in this category to denote small retail cuts for which the element represented was uncertain.

Three separate quantitative methods are used in this report to examine patterning in the data: Minimum Number of Individuals (MNI), Minimum Number of Butchered Units (MBU), and Number, or count, of Identified Specimens (NISP). Both MNI and MBU were calculated by determining the Minimum Number of Individuals/meat cuts necessary to account for the largest number of elements in the sample from individuals in different age groups. For fish, which continue to grow throughout their lives, MNI was determined both by numbers of elements and by the size of the individuals represented in the sample.

While Number of Identified Specimens is an unchanging measure of bone frequency regardless of how a sample is subdivided or aggregated, Minimum Numbers of Individuals and Minimum Number of Butchering Units both are subject to variability in result with different approaches to subdividing a sample of bone (cf. Grayson 1979 for discussion of this problem). Consequently, these measures of relative abundance are calculated twice for the sample -- first for each "cluster" of bone, and secondly, for the assemblage as a whole. Since feature-based calculations probably have more real meaning with respect to human behavior, it is the main quantitative unit used for analytical purposes in this report.

One of the most serious problems facing analysts of historic faunal materials is that salt pork consumption, if it is visible at all, may not be distinguishable from fresh pork consumption. Since salt pork was shipped in barrels and might contain the bones of one or more or perhaps even no individuals, a wild card is introduced when considering faunal evidence for the quantity of pork consumed. Rations publicly contracted for through a local ad in the Arkansas Gazette in 1823 illustrates this dilemma. The ad called for 200 barrels of salt pork "to consist of an entire hog to the barrel, except the feet, legs, and snout...Should the hogs be of less weight than 200 lbs. the deficiency is to be made up of good fat side pieces"(Bearss and Gibson 1969:81). If the preserved meat was customarily shipped in this manner, then most of the bones of one individual should be present and, although considerably cut up during packing for shipment, should be approximately representative of a single individual excluding the lower limbs. However, the fact that the bone was highly fragmented and hence less identifiable, coupled with the addition of side pieces (i.e., bacon, which is boneless) to make up any shortfall, clearly indicates that any attempt to translate bones into meat equivalents will underestimate pork consumption to some (probably considerable) extent even under the best of circumstances.

Regardless of these specific analytical hurdles, this sample of bone can provide insights into differences in meat utilization both between specific areas adjacent to the fort and between Fort Smith and other military installations. The primary value of an archaeological faunal sample resides in comparisons to other samples.

THE ANALYSIS

Of the 3,773 bones in the assemblage from Fort Smith, 670 or almost 18% were identifiable at least to the level of taxonomic family. An additional 2,415 fragments could be identified at least to the level of class, bringing the total amount of "identifiable" bone to 3,085 fragments -- over 80% of the total fragments recovered. It is likely that much of the bone identified as "very large mammal" in fact derives from cattle, although some may be fragments from very large adult pigs, which based on dentition data and element size were rare in the assemblage. Most of the identifiable Sus remains were from juveniles less than two years of age, or from adults about half the size of today's "super-domestic" variety, which much more closely approaches the size of a small cow. (We are here indebted to Elizabeth Reitz for alerting us to the presence of typically small Sus remains for sites predating the 20th Century). Therefore, the "large mammal" category probably contains predominately young and average-sized adult pig bones with a small percentage of fragments being the remains of deer, sheep, or goat.

Several of the identification categories used in this analysis require comment. Some species are very difficult to distinguish between osteologically, and consequently are grouped into more inclusive categories such as sheep/goat, deer/sheep/goat, and cow/bison. It is probable that all of the sheep/goat bone is actually sheep, since herds of sheep (and cattle) were reportedly kept for food purposes at neighboring Fort Towson in Choctaw County, Oklahoma, as early as 1844 (Lewis 1972:80). Likewise, although at least two bones were within the size range of bison, both probably are the remains from rather large cows, since the earliest written accounts of the area surrounding the fort mention an abundance of only bear and deer in the area (Nuttall 1824:148-149) with the exception of some noteworthy "buffalo" kills 15 miles upriver during the severe winter of 1822 (Bearss and Gibson 1969:58).

Sixteen species were identified in the sample (Table 2), ranging in size from a tiny unidentified sucker less than 8 inches long (estimated standard length 10-20 cm), to a probable cow (listed as cow/bison) within the size range of a small male bison. Seventy percent of the identified bones are from domesticated food species: cattle, hogs, chickens, sheep/goats, and turkeys. Pets (a dog and probably 2 cats), and the ever- present and in this case quite numerous, rat (Rattus sp.), round out the species usually associated with historic sites. Wild species include opossum, raccoon, fox squirrel, three species of rabbits, white-tailed deer, several waterfowl, at least five species of turtle, and at least three species of fish.

TABLE 2: Common and Scientific Names of Species Identified in the Fort Smith Pedestrian Walkway Excavations

Opossum	Didelphis virginiana
Raccoon	Procyon lotor
Fox Squirrel	Sciurus niger
Rat	Rattus sp.
Rabbit, indet.	Sylvilagus sp.
Cottontail	S. floridanus
Swamp rabbit	S. aquaticus
Jackrabbit	Lepus sp.
White-tailed deer	Odocoileus virginianus
Sheep/Goat	Ovis aries/Capra hircus
Pig	Sus scrofa
Cow/Bison	Bos taurus/Bison bison
Domestic dog	Canis familiaris
Domestic cat	Felis domesticus
Duck, indet.	Anas/Aythya sp.
Teal	Anas crecca/discors
Coot	Fulica americana
Turkey	Meleagris gallopavo
Chicken	Gallus gallus
Songbird	Passeriformes
Snapping turtle	Chelydra serpentina
Pond turtle	Chrysemys/Graptemys
Map turtle	Graptemys sp.
Box turtle	Terrapene carolina
Softshell turtle	Trionyx sp.
Sucker	Catostomidae
Buffalofish	Ictiobus sp.
Catfish	Ictalurus sp.
Channel/Blue cat.	I. punctatus/furcatus
Freshwater drum	Aplodinotus grunniens

Tables 3 and 4 illustrate the distribution of faunal remains by count and minimum number of individuals among the three defined bone concentrations, as well as for the assemblage as a whole. Although included in the total MNI for the entire assemblage, MNI was not independently calculated for the bones listed as "all other samples combined" in Table 3. These bone fragments were thinly scattered across the site and hence, were not necessarily associated with one another.

INTERSITE PATTERNING

Faunal data are available for two military outposts similar in size and character to Fort Smith prior to the construction of the second fort in the late 1830s and early 1840s. Unfortunately, only a species list is available for Fort Towson, a frontier fort located on the Red River in Oklahoma (Lewis 1972). The species recovered there -- cow, bison, pig, deer, rabbit, and eastern wood rat -- all indicate utilization of the forests adjacent to the river in addition to the grasslands in the surrounding prairie.

The available data from Fort Washita (Penman 1975), located further up the Red River and also in Oklahoma, are sufficiently detailed to allow a quantitative comparison. Like Fort Towson, the fauna from Fort Washita suggest exploitation of both riverine and prairie environments, with the addition of swamp rabbit, gray fox, ferret (?), chicken, turkey, mourning dove, redwinged blackbird, and ornate box turtle added to the list of species identified. When the quantity of very large, large, and small mammals, birds, turtles, and fish are compared for Fort Smith and Fort Washita (Table 5), the resulting percentages are quite similar. Aquatic species were of far less importance at Fort Washita (2.4% vs. 0.5%), and domesticated fowl were of greater importance there (4.3% vs. 8.8%, assuming most unidentifiable bird bone is from chickens/turkeys). However, the most interesting pattern is that there is a much greater disparity between the contribution made by large (i.e., pig) and very large (i.e., cow/bison)

TABLE 3: Counts (NISP) of Bone from Fort Smith Pedestrian Walkway Excavations

	"Area V"		"Area W"		Cluster 3		All Other Samples Combined		Total Assemblage	
	NISP	%	NISP	%	NISP	%	NISP	%	NISP	%
Unid. bone	349	20.1	71	18.5	108	15.5	160	16.8	688	18.2
Very lg. mammal	415	23.9	75	19.3	310	44.5	399	41.8	1199	31.8
Lg. mammal	472	27.2	110	28.7	189	27.1	271	28.4	1042	27.6
Med. mammal	30	1.7	3	0.8			2	0.2	35	0.9
Sm. mammal	11	0.6							11	0.3
Opossum			1	0.3					1	*
Raccoon	4	0.2							4	0.1
Fox squirrel	1	0.1							1	*
Rat	74	4.3	5	1.3			1	0.1	80	2.1
Rabbit	2	0.1							2	0.1
Cottontail	9	0.5					1	0.1	10	0.3
Swamp rabbit					1	0.1			1	*
Jackrabbit	1	0.1							1	*
Deer					5	0.7	1	0.1	6	0.2
Lg. bird	1	0.1	2	0.5	1	0.1	2	0.2	6	0.2
Med. bird	43	2.5	3	0.8			3	0.3	49	1.3
Sm. bird	4	0.2					1	0.1	5	0.1
Unid. bird	24	1.4	5	1.3	2	0.3	12	1.3	43	1.1
Med. duck			2	0.5					2	0.1
Teal	2	0.1							2	0.1
Coot			1	0.3					1	*
Songbird	2	0.1							2	0.1
Unid. turtle			9	2.3					9	0.2
Snap. turtle			1	0.3					1	*
Pond turtle			7	1.8					7	0.2
Map turtle			1	0.3					1	*
Box turtle			6	1.6					6	0.2
Softshell turtle	4	0.2	7	1.8					11	0.3
Unid. fish	12	0.7	2	0.5					14	0.4
Sucker	12	0.7					1	0.1	13	0.4
Buffalofish	1	0.1							1	*
Catfish	2	0.1	4	1.0					6	0.2
Chan/blue catfish	4	0.2							4	0.1
Drumfish	18	1.0	1	0.3					19	0.5
Cow/bison					1	0.1	1	0.1	2	0.1
Cow	68	3.9	39	10.2	46	6.6	76	8.0	229	6.1
Pig	77	4.4	20	5.2	18	2.6	14	1.5	129	3.4
Sheep/goat	31	1.8	5	1.3	5	0.7	2	0.2	43	1.1
Deer/sheep/goat	11	0.6			8	1.2	2	0.2	21	0.6
Dog							1	0.1	1	*
Cat	1	0.1			1	0.1			2	0.1
Chicken	44	2.5	4	1.0	1	0.1	3	0.3	52	1.4
Turkey	7	0.4	1	0.3	1	0.1	2	0.2	11	0.3
TOTAL BONE*	1736		385		697		955		3773	
Eggshell	5								5	
Mussel	8				5		5		18	

*Does not include mussel and eggshell fragments.

TABLE 4: Minimum Numbers of Individuals for Samples of Bone from the Fort Smith Pedestrian Walkway Excavation

	"Area V"	"Area W"	Cluster 3	Sum of MNI from Bone Concentrations		Total Assemblage	
	MNI	MNI	MNI	MNI	%	MNI	%
Opossum		1		1	1.4	1	1.8
Raccoon	1			1	1.4	1	
Fox squirrel	1			1	1.4	1	
Rat	7	1		8	11.1	7	12.5
Rabbit	0			0		0	
Cottontail	1			1	1.4	1	
Swamp rabbit			1	1	1.4	1	
Jackrabbit	1			1	1.4	1	
Deer			1	1		2	3.6
Med. duck		1		1	1.4	1	
Teal	1			1	1.4	1	
Coot		1		1	1.4	1	
Songbird	1			1	1.4	1	
Snap. turtle		1		1	1.4	1	
Pond turtle		0		0		0	
Map turtle		1		1	1.4	1	
Box turtle		1		1	1.4	1	
Softshell turtle	1	1		2	2.8	1	
Sucker	4			4	5.6	4	7.1
Buffalofish	1			1	1.4	1	1.8
Catfish	1	1		2	2.8	2	3.6
Chan/blue catfish	1			1	1.4	1	1.8
Drumfish	4	1		5	6.9	5	8.9
Cow/bison	0			0			
Cow	2	2	3	7	9.7	4	7.1
Pig	4	3	2	9	12.5	5	8.9
Sheep/goat	3	1	2	6	8.3	3	5.4
Deer/sheep/goat	0			0			
Dog						1	1.8
Cat	1		1	2	2.8	1	1.8
Chicken	6	1	1	8	11.1	5	8.9
Turkey	1	1	1	3	4.2	1	1.8
TOTAL BONE*	42	18	12	72		56	
Eggshell	*			*		*	
Mussel	*			*		3	

*Denoted by presence/absence only.

TABLE 5: Comparison of Relative Frequency of Taxonomic Groups at Forts Smith and Washita.

Taxonomic Group	Fort Smith % NISP	Fort Washita % NISP
Very large mammal	46.4%	49.9%
Large mammal	40.1%	37.7%
Small/Medium mammal	5.0%	2.5%
Bird	5.7%	9.1%
Turtle	1.1%	0.5%
Fish	1.9%	0.4%

mammals at Fort Washita (37.7% and 49.9% respectively) than at Fort Smith, where very large mammal bone is only slightly more numerous than large mammal bone (46.4% and 40.1% respectively).

The greater representation of very large mammal at Fort Washita presumably reflects the greater local availability of cows and bison further out on the Plains, where fewer live pigs would have been kept as livestock. In contrast to Fort Smith, pig consumption at Fort Washita may have mainly been salt pork.

INTRASITE PATTERNING

The most striking pattern in the condensed NISP data for the various deposits at Fort Smith (Table 6) is that the NISP composition of the different assemblages near Areas V and W is quite similar, and both differ significantly from Cluster 3. Furthermore, the assemblage from Cluster 3 does not differ appreciably in composition from bones recovered throughout the remaining excavation units (i.e., "all other samples combined").

TABLE 6: Relative Frequency of Taxonomic Groups from Various Bone Concentrations Excavated as Part of the Fort Smith Pedestrian Walkway Excavations.

Taxonomic Group	% NISP "Area V"	% NISP "Area W"	% NISP Cluster 3	% NISP Other Samples
Very Large Mammal	34.8%	36.3%	60.6%	59.9%
Large Mammal	42.6%	43.0%	38.2%	36.5%
Medium/Small Mammal	9.6%	2.9%	0.3%	0.6%
Bird	9.2%	5.7%	0.9%	0.6%
Turtle	0.3%	9.9%	0	0
Fish	3.5%	2.2%	0	0.1%
SAMPLE SIZE (n)	1387	314	589	795

As noted previously, Area V is believed to be the remains of a structure erected as a temporary barracks around 1849, and used for that purpose and others over the next several decades. An overwhelming number of buttons in addition to female related artifacts such as combs and hairpins suggests that it may also have served as laundress' quarters at some time.

Area W was a small debris-filled depression located on the edge of the median strip (Coleman 1987). It may have been associated with another structure, since destroyed by railroad construction, or [illegible] may simply be an extension of the midden associated with Area V to the north.

There are certain intriguing similarities between the samples from the vicinity of Areas V and W in both form and content that suggest they may be part of the same deposit or at least contemporaneous. For example, far more burned bone was found in these deposits than elsewhere on the site. Nearly 11 percent of the fragments from around Area W were charred with the frequency dropping to 4.7 percent near Area V. In contrast, charred bone comprised only 3.7 percent of the remaining bone on the site, including the bone in Cluster 3. Since no patterning was observed in the charring of identified elements, it is unlikely that the charring relates to differential rates of specific cooking methods. Rather, most charred bone probably was burned accidentally either during discard or after discard as a result of nearby structures burning. The latter explanation could account for the amount of charred bone in Area V, since the frequency decreases gradually toward Area W to the south.

Deposits adjacent to Areas V and W also have the dubious distinction of producing 79 of 80 rat bones identified in the assemblage. The frequency of occurrence is again higher in the Area V sample, possibly indicating that it was a richer midden than that near Area W or that the soldiers/laundresses responsible for the deposit lived in more squalid (or at least less sanitary) conditions than the persons responsible for the deposit near Area W. The "Area V" midden also produced one of two cat bones found at the site, no doubt highly coveted and necessary pets, as well as the only gnawed bones found in the assemblage (three by rodents, one by a carnivore, probably a dog).

In terms of subsistence remains, deposits near Areas V and W both show a higher incidence of large mammal bone (pig, sheep/goat/deer) than of very large mammal (cow/bison) compared to the remainder of the site. In addition, these two areas produced almost all of the wild fauna encountered during excavation. These facts combined would seem to suggest that these deposits may predate Cluster 3, and may reflect greater quantities of the traditional soldier's ration of salt pork and beans, supplemented by wild game in an attempt to add variety to the diet. Although cow-sized bones are outnumbered by smaller mammal remains, beef probably supplied at least an equal amount of fresh meat to the diet since each bone fragment, on average, represents a greater portion of meat.

Nearly all of the wild fauna in the Area V and W midden is from taxa found in or near the water. Only the cottontail, jackrabbit, fox squirrel, and box turtle would have been procured away from the river. Furthermore, nearly all of the riverine taxa could have been captured with passive devices, either set- lines or traps, and thus would not have interfered with the various military duties of the hunters. The large number of turtle bones in the Area W sample may indicate occupation of that area by soldiers of higher rank or a family (officer's?) accorded somewhat higher status, since turtle soup is commonly regarded a great delicacy.

In contrast to deposits near Areas V and W, bone samples from the remainder of the site are impoverished. Most of the identified bone is the byproduct of beef consumption, and fully 96% or more of the sample is comprised of large and very large mammal bone. The lack of diversity in Cluster 3 and elsewhere on the site may be due to poor conditions of preservation. Between 80 and 90% of the "elements" in this portion of the site fell into either the longbone or indeterminate fragment category, both possibly more indicative of extreme pre-depositional or post-depositional fragmentation than actual patterning in behavior (see Table 7).

BUTCHERING PATTERNS

Following Lyman's (1979a) now standard example of quantifying the butchered remains typically found on historic sites, each identifiable element exhibiting saw or fillet marks was recorded on illustrations of the elements. Because the examples of butchered bone in the sample all are illustrated in Lyman's analysis, and presumably are therefore relatively standard for dismembering carcasses for consumption, they will be described rather than illustrated.

TABLE 7: Number of Identified Specimens (NISP) by Butchering Unit for Cow and Very Large Mammal Fragments, and for Deer, Sheep/Goat, Pig and Large Mammal Fragments.

Provenience	Identification	Body Part								
		Skull	Neck	Loin & Ribs*		Forelimb	Hindlimb	Feet	Indet. long bone	Indet. frags.
Area V	very lg. mammal	13	4	120(4)	12	14	4	4	189	124
	lg. mammal	52	8	104(2)	8	24	15	18	170	192
Area W	very lg. mammal	0	4	29	1	10	9	0	30	31
	lg. mammal	13	0	15(1)	2	4	8	2	39	32
Cluster 3	very lg. mammal	6	1	17(1)	3	23	6	7	232	62
	lg. mammal	12	2	13(1)	2	8	11	4	93	80
Other bone	very lg. mammal	7	4	66(1)	2	27	20	5	270	75
	lg. mammal	12	0	8	0	2	4	4	144	116
TOTAL FOR SITE	very lg. mammal	26	13	232(6)	18	74	39	16	721	291
	lg. mammal	89	10	140(4)	12	38	38	28	446	440

* Includes thoracic vertebrae plus unidentifiable vertebral fragments.

Many of the observed cuts appear to represent small, retail cuts of meat, most of which probably would not exceed a weight of 3 or 4 lbs. One Bos atlas had been cut up into pieces, presumably to use as a soup bone. Likewise, all of the cuts observed on radio-ulna and tibia shafts indicate sawing of the bone perpendicular to the shaft, presumably to use as soup bones. Segments ranged in size from approximately two to six inches in length. Meatier portions of the skeleton (ribs, scapulae, humeri, innominates and femurs) indicate either disarticulation into standard butchering units (Figure 1) or again, small retail cuts such as round, arm, sirloin, and ham steaks. Several vertebrae exhibiting saw cuts indicate the carcasses were split in half during the butchering process. The regularity of the observed butchering patterns probably indicates that at the time these samples were deposited, much of the fresh beef and pork consumed at the fort was procured locally from professional butchers.

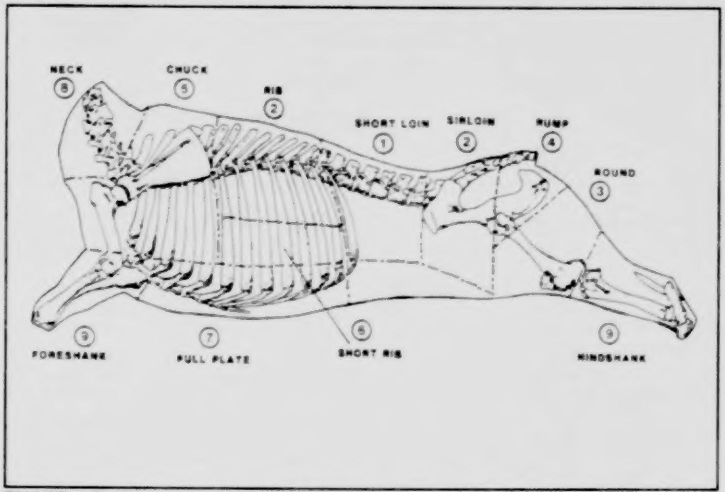

FIGURE 1 Butchering units of beef ranked as to relative value (After Schulzand Gust 1980:Figure 15).

The minimum numb[illegible] butchered units in each sample and for the entire assemblage shows a d[illegible] e. preference for the relatively inexpensive cuts, predominately the chuc[illegible] tion of a side of beef. Although the relative value of cuts of beef may chan[illegible] ver time, the hindlimb and tenderloin portions are considered choice. The data presented in Table 8 show both MBU and the identified cuts of meat for each sample, ranked according to the relative value established by Gust and Schultz (1980) for beef in 19th century Sacramento. Although quite a few choice cuts were present in the samples, the majority of cuts found in the assemblage were not, a finding consistent with the interpretation of occupation of these areas by soldiers of relatively low rank. It should be noted that "choice" cuts were relatively more common near Area W than elsewhere on the site, again possibly indicating a somewhat higher status origin for this deposit.

The high numbers of small cuts of meat in addition to a significant amount of pre-depositional bone breakage probably indicates the customary use of meat as a base for soups and stews capable of stretching resources to feed many mouths. A military cookbook originally published in 1861 recommends the use of cuts weighing between 3 and 5 lbs. in preparing soup, and even suggests that the cook "chop up the bones" to produce richer broth (Scott 1974). Both directives seem to have been followed slavishly if these bone fragments are accurate reflections of past behavior.

SUMMARY

Patterns evoked by the foregoing analysis of fauna produced by the 1985-88 Pedestrian Walkway Excavations conform in a general way to expectations regarding subsistence at frontier forts in the early to mid 19th Century. Domestic species, in particular pig and cow, provided the bulk of meat eaten by those who produced the middens encountered during excavation. Although no direct means are available for differentiating zoo- archaeologically preparation of salt versus fresh pork, both are assumed to have contributed to the diet of the fort's residents. Fragmentation and butchering patterns generally suggest stew pot fare expectable in a miliary mess. Bones of wild taxa indicate that local hunting and fishing helped to alleviate the monotony of military rations, but played only a supplemental role in the overall diet.

Beyond these general patterns, comparison between areally differentiated bone concentrations point to the possibility for either status and/or temporal differences in food consumption patterns. Deposits of bone adjacent to Area V and Area W produced higher proportions of wild taxa, possibly indicating an earlier phase of occupation prior to the growth of residential areas surrounding the fort. The sample of bone adjacent to Area W is distinguished by greater proportions of better meat cuts as well as by a significantly greater amount of turtle remains. Both suggest the possibility that this midden was associated with

Table 8: Minimum Number of Butchering Units for Cuts of Beef and Pork in Bone Concentrations from the Fort Smith Pedestrian Walkway Excavations.*

	AREA V MBU (cuts)	AREA W MBU (cuts)	CLUSTER 3 MBU (cuts)	TOTAL ASSEMBLAGE MBU (cuts)
BEEF				
Short loin	3(2)	1	0	3(2)
Ribs	3(4)	1	0	3(17)
Sirloin	1(4)	1(3)	1(1)	2(12)
Round	2(1)	2(3)	1	3(11)
Rump	2(2)	2(2)	0	3(6)
Chuck	7(4)	5(5)	6(5)	7(37)
Shortribs	1(3)	1(1)	0	3(6)
Full plate	2	1	1	2
Neck	1(2)	1	1	2(3)
Foreshank	3(3)	2	3(5)	4(14)
Hindshank	1	2(1)	3(2)	3(5)
Indet steak/chop	(25)	(11)	(45)	(136)
PORK				
Shortcut ham	2(1)	3	2(1)	3(3)
Loin	2(1)	0	0	2(1)
Picnic shoulder	2(1)	1(1)	3	4(2)
Rib belly	1	0	0	1
Feet	2(1)	0	0	2(1)

*Numbers in parentheses refer to specific, usually small retail cuts included in the larger butchering unit. Definition of MBU follows Lyman (1979:Table 3).

an officer's mess, officer's family residence, or some other similarly high status group at the fort.

In deposits near Area V the remains of a cat suggests nearby domiciles. Its remains in this midden may be related to the apparently large population of resident rats, which are well represented in the sample. Rats may indicate a relatively greater or more constant rate of refuse deposition, nearby food storage, or generally less sanitary conditions relative to other areas exposed by excavation.

In contrast to deposits near Areas V and W, the sample from Cluster 3 as well as other areas sampled by excavation is less diverse and more fragmentary. Rates of deposition and subsequent burial may be presumed to have been slower, offering reduced chance of preservation. Lower representation of wild fauna may indicate a later date for these deposits, although differential preservation cannot be discounted.

It should be noted that there are a number of factors that reduce the confidence that can be placed in the foregoing interpretations. Small sample size and high degree of fragmentation both affected recognition of potentially meaningful patterning, particularly when the sample was subdivided to search for intrasite differences. Further, the fragmentary nature of the sample reduced the possibility of distinguishing between the most significant taxa for understanding military foodways, specifically pig, cow, deer, sheep, and goat. Finally, greater temporal and contextual control would enhance the possibilities for making meaningful interpretations of these patterns that were recognized.

The fauna recovered from the Pedestrian Walkway mitigation should, nonetheless, provide a significant comparative sample for future analysts. As assemblages from different areas in and around the fort become available, the samples, particularly those from the vicinity of Areas V and W, will become increasingly important for understanding military provisioning on the American frontier.

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APPENDIX 3

LIST OF DBASE TABLES (available on request)

TABLE

DB.1 Miscellaneous kitchen group artifacts.
DB.2 Cast iron containers.
DB.3 Tin containers.
DB.4 Miscellaneous artifacts associated with product containers.
DB.5 Cutlery.
DB.6 Utilitarian stoneware vessels.
DB.7 Ceramic product containers.
DB.8 Ceramic kitchenwares.
DB.9 Ceramic tablewares.
DB.10 Glass containers.
DB.11 Floral remains.
DB.12 Faunal remains.
DB.13 Construction hardware.
DB.14 Miscellaneous construction material.
DB.15 Sheet metal clippings.
DB.16 Window pane.
DB.17 Brick.
DB.18 Slate shingle.
DB.19 Nails.
DB.20 Mirror glass.
DB.21 Miscellaneous domestic furnishings.
DB.22 Stove parts.
DB.23 Ceramic furnishings.
DB.24 Gun furniture and accessories.

DB.25 Copper percussion caps.

DB.26 Metallic cartridges.

DB.27 Lead projectiles.

DB.28 Lead casting debris.

DB.29 Canister shot.

DB.30 Straight pins.

DB.31 Shoe leather.

DB.32 Clothing fasteners.

DB.33 Military accouterments.

DB.34 Civilian buttons.

DB.35 Uniform buttons.

DB.36 Whitemetal fatigue buttons.

DB.37 Personal artifacts.

DB.38 Clay pipe fragments.

DB.39 Miscellaneous activities group artifacts.

DB.40 Lead bale seals.

DB.41 Iron barrel hoop fragments.

MF.42 Wagon bow staples.

DB.43 Harness buckles.

DB.44 Copper harness rivets.

DB.45 Wagon hardware and accessories.

DB.46 Horseshoes and muleshoes.

DB.47 Iron production debris.

DB.48 Copper production debris.

DB.49 Unidentifiable artifacts.

DB.50 Prehistoric artifacts.

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